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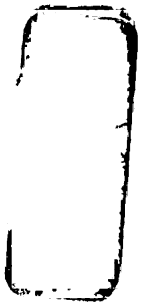

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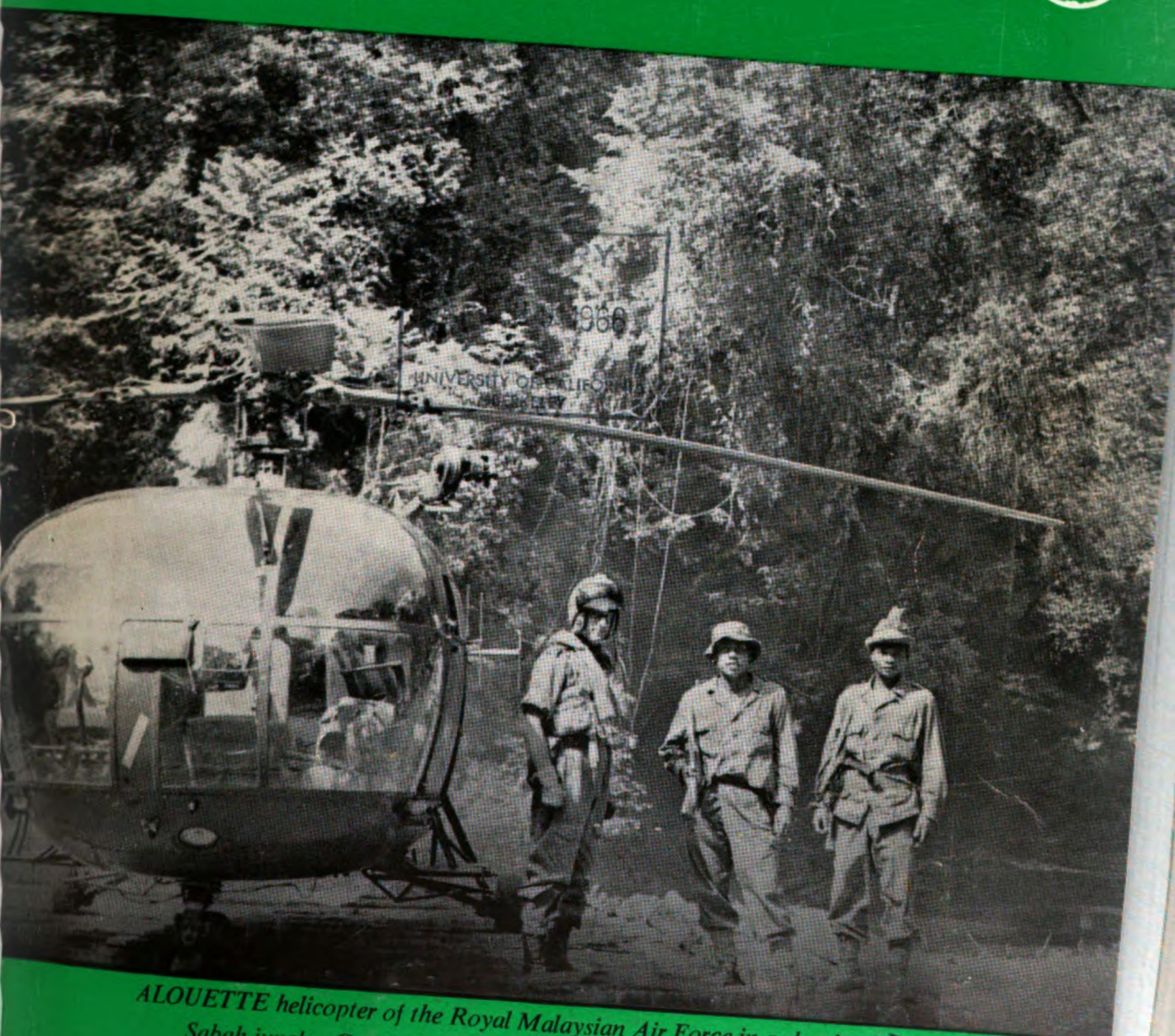

ALOUETTE helicopter of the Royal Malaysian Air Force in a clearing in the Sabah jungle. Ground security force soldiers stand beside the pilot

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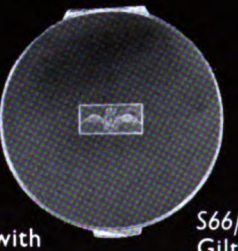

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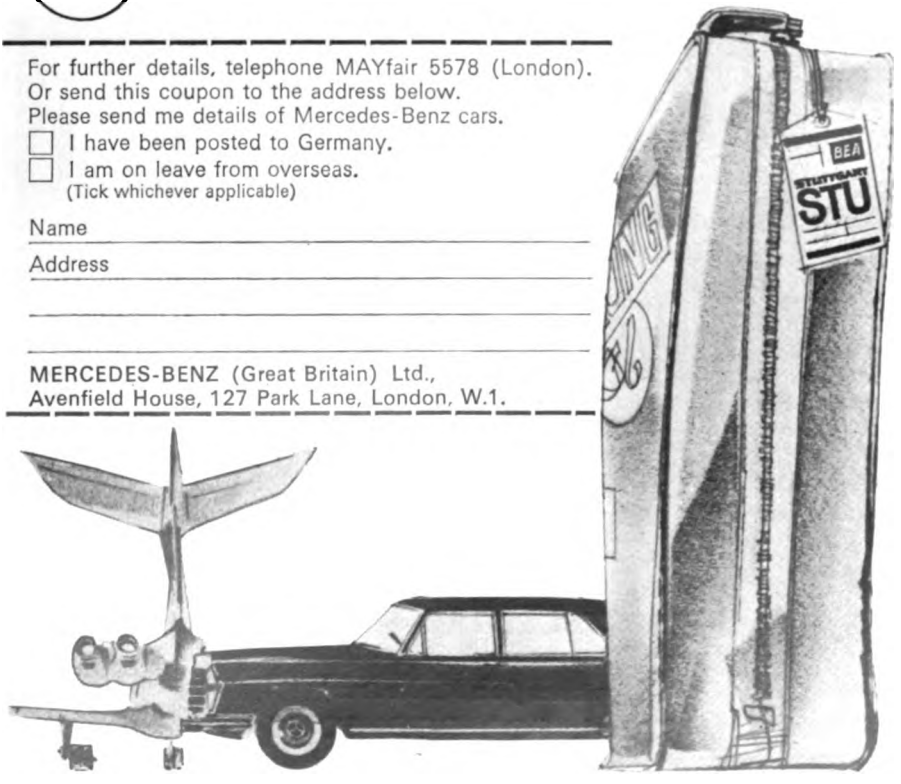

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THE ROYAL AIR FORCES QUARTERLY

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THE COVER PICTURE

A Pilot of a Royal Malaysian Air Force "Alouette" lands in a clearing in the dense jungle. He is escorted by two Malaysian soldiers.

(See article "ROYAL MALAYSIAN AIR FORCE" page 37)

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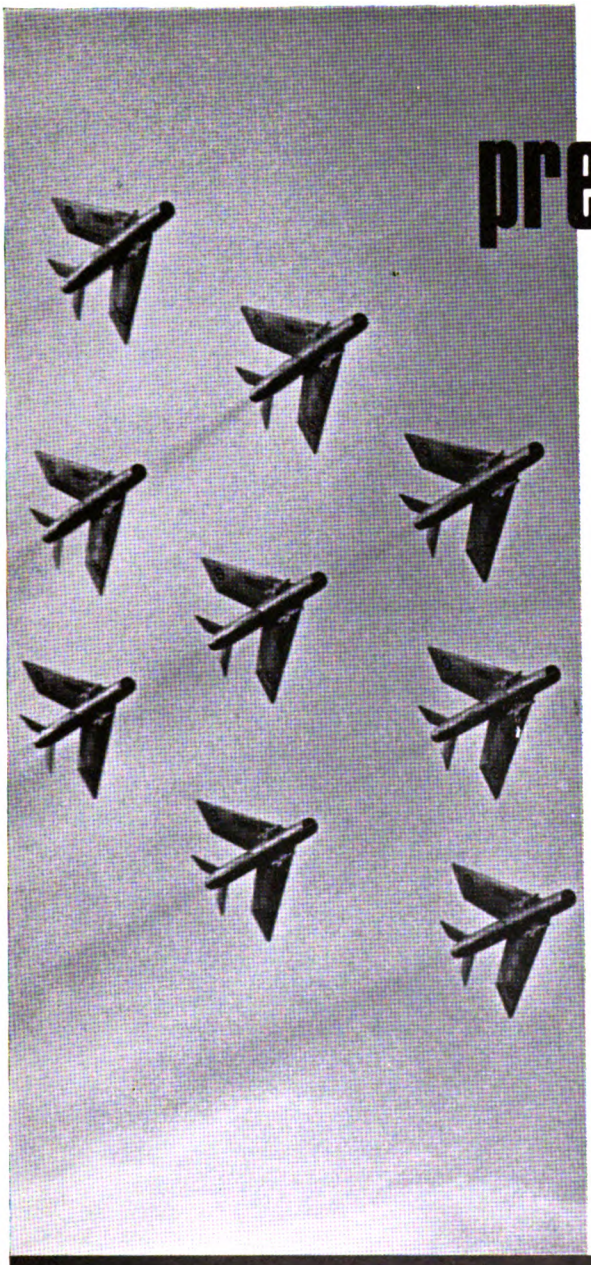

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CO-OPERATION IN FAR EAST

An Air Commodore of the Royal Air Force accepts an invitation to "drop-in" on the Royal Navy

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"FEARS MAY BE LIARS"

By Dr. C. L. Wayper, M.A., Ph.D.

THE fighting between India and Pakistan, we were told, might well precipitate world war. The same is said of the strife in Vietnam, as it was of the Berlin or the Korean or the Cuban crises. However, as this has escaped us so far it would seem timely to ask if the world is indeed in the parlous condition in which we have deemed it to be.

We may well doubt it. It is as true as it has always been, that only the Great Powers can cause great war. Tails do not wag dogs, and while small states have provided the occasion for Great Power conflict it has always lain with the Great Powers to decide whether or not to make use of that occasion. And since we have good reason to believe that the Great Powers are most unlikely to go to war with each other the world conflagration we all wish to avoid is hardly likely to materialise.

It has often been observed that States are encouraged to good behaviour by lack of opportunity to indulge in bad, and that few things convince them that such opportunity is lacking more than the realisation of the fact that those against whom they might otherwise entertain designs are fully as strong as themselves. It is worth recalling that neither in 1914 nor in 1939 did Germany believe this, being on the contrary convinced that she was strong enough to impose her will on her neighbours. Today, however, the Great Powers know that formidable as is their power, it is balanced by equally imposing might. Sputniks notwithstanding, the USSR admitted this by her rejection of the Chinese view that the East wind was now prevailing over the West wind and the US, Presidential addresses notwithstanding, by her demonstration of the truth that the Republican policy of liberation differed in no single respect from the former Democratic policy of containment. Moreover this balance in which the Great Powers now find themselves is likely to be far more stable and more enduring than any previous balance of power. This is because their power is so enormous that the additions to it that allies might bring or the subtraction from it that might result from their loss would not, as hitherto, suffice to upset it. Indeed if this was our only ground for optimism, as it is not, it would be sufficient reason for believing that we are not after all living in the worst of all possible worlds.

The very thing that convinces many that we are, namely nuclear power, is yet another ground for doubting the likelihood of war between the Great Powers. For they now possess the capacity to inflict intolerable damage on each other, which is to say they lack the ability to avoid receiving it themselves. So long as this is the case they know that if ever they met in battle they could hope only for strictly limited

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gains, for if vital interests were endangered nuclear rockets would fly. Yet strictly limited gains would justify neither the bitter conflict that would result from their clash nor the risk that a mistake might be made in the assessment of what the enemy would regard as a vital interest. The passions aroused when men fight must not blind us to the fact that the act of making war is itself a rational act. States fight when they think they can do so with advantage to themselves and keep the peace when it seems that they cannot. What State ever went to war in the conviction that it would be better for it to remain at peace? Their reasons may turn out to be wrong, as has so frequently been the case. But wrong reasons are not the same as irrational flings of passion. In the circumstances of today it would be utterly irrational for the Great Powers to wage war on each other. And they have said so in what Burke calls the only language that never lies, their conduct. Even when they have mistakenly believed that opportunity has presented itself for roystering activity they have in the event allowed caution to prevail. Khruschev preferred to lose his face over Cuba as that was the price of keeping his head. What is true of existing Great Powers will equally apply to future Great Powers. It is impermissible to deduce from what is said in one set of circumstances the action that will be taken in quite different conditions. And when China achieves the Great Power status which is not yet securely within her grasp, she will be as chary of Great Power conflict, which she has in any case carefully avoided since Korea, as all of the group that she joins now are.

But if we have reason to think that Great Power war has now become unlikely we are not, unfortunately, entitled to argue that we have banished all war from the earth. Such dislocation of established patterns of power as has occurred in Africa and in Asia is always productive of conflict, for it leaves behind it States of unequal power, peoples of conflicting loyalties and multitudes of opposed claims. In such circumstances it is impossible to convince men that war is not either profitable or the sole way to secure what they believe to be justice. It is a delusion to think that the United Nations can help much here. It can, perhaps, reconcile those to keeping an uncertain peace on whose fortunes the war gods have not noticeably smiled. But it cannot resolve the issues which will make them fight when they think the time ripe to do so. If, for instance, the US was prepared to try, through the United Nations, to force India to relinquish Kashmir, could the USSR be expected to support her efforts? Even if she possessed, contrary to all expectation, such virtue as to refrain from seizing the opportunity of strengthening her own influence in India by supporting her against the US, could she afford, in view of her relations with China, to run the risk not only of antagonising, but also of weakening a country which already looks unkindly upon China and which might play a significant part in developing an Asian balance of power? And in view of this very consideration would the US be at all likely to seek to compel India to relinquish Kashmir? The increasing stability of Great Power relations and the greater promise of peace that it brings must not delude us into thinking that if indeed we have got nearer to the Garden of Eden, we are likely to find the key thereto. For the world which has made total war improbable has made local war certain.

Ours, in fact, is a world of stable chaos, or, if we prefer it, of chaotic stability.

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We are lucky in that in the part of the world in which we ourselves live, the stability is markedly more significant than the chaos. We are unlucky in that in parts of the world in which our interests are considerable, the chaos is more apparent than the stability. We cannot alter this, however ardently we wish to do so. It is still true, as Burke said, that if men like children cry for the moon, like children they will continue to cry. It is worth, however, reminding ourselves that, in spite of the eccentric theories which maintain that by fighting local wars which the West can never hope to win it will be possible eventually to win the total war which the West can never dare to fight (as if total victory and total defeat, even should the unproven premise here be correct, could ever issue from local and limited war), in spite of equally wrong-headed notions that defeat anywhere is defeat everywhere and so must at all costs be avoided, the wars that have occurred in the chaotic areas of the world from Korea to Vietnam have all been most carefully limited. For this speaks eloquently of Great Power determination to ensure that nothing in these areas of chaos shall destroy or change those underlying realities that, by making war between the Great Powers, total and unlimited, so very improbable, have already made much of the world far more stable than it has recently been. States may remind us, as Schopenhauer said men did, of hedgehogs huddling together for warmth—they are a prickly lot. But they are not fittingly to be compared, as Kennan compares them, with those primaeval monsters which, so he tells us, expressed their anger at being disturbed in such convulsions as to destroy their own habitat. No one looking at the world today is entitled to conclude that this is what they are doing.

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The *final dates* upon which articles must reach the Editor for inclusion in the Spring, Summer, Autumn and Winter numbers are: —

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The early delivery of copy would be greatly appreciated.

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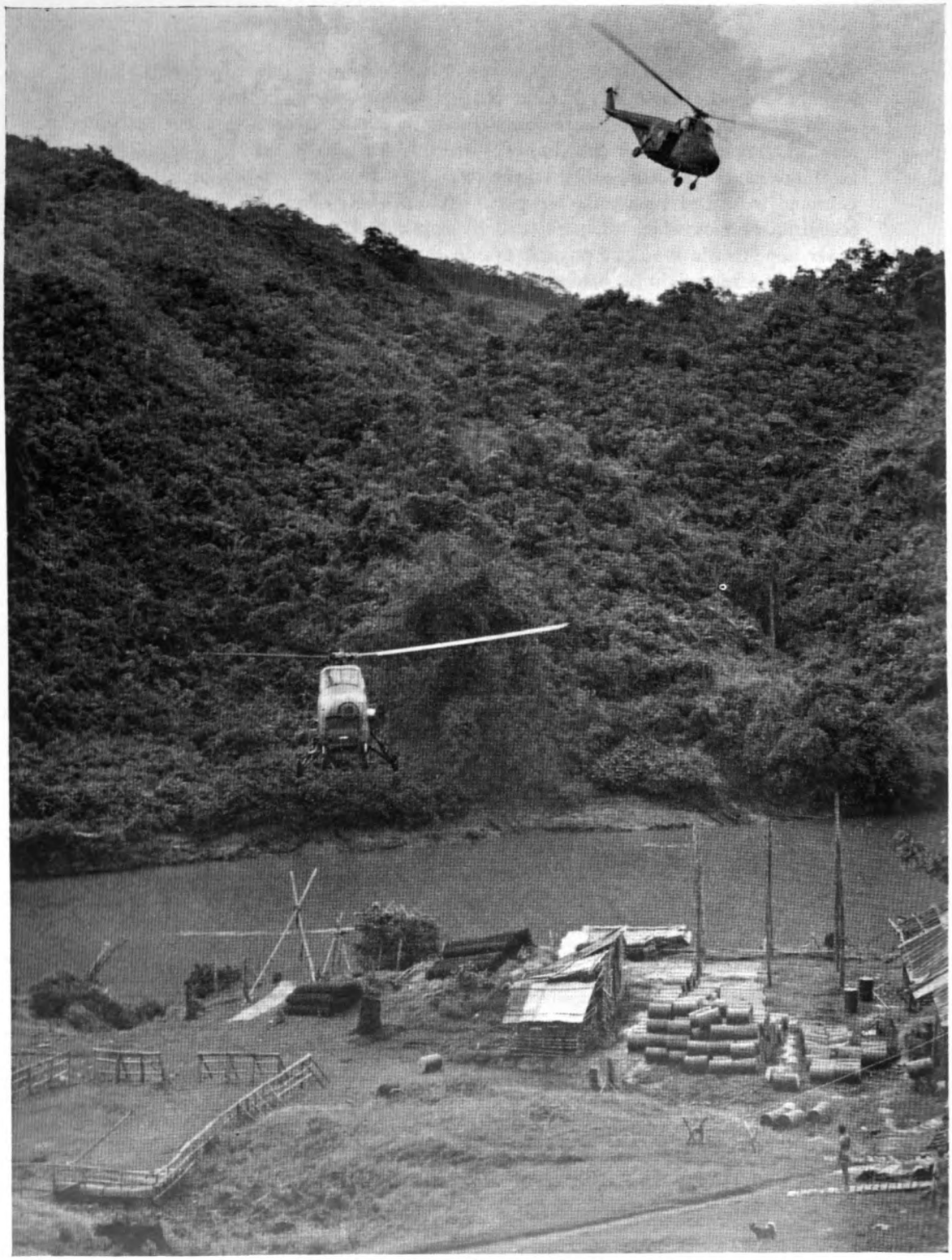

Landing — Nanga — Gaat

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HELICOPTERS IN MALAYSIA

By Wing Commander D. L. Eley

Foreword

MILLIONS of miles have now been flown by R.A.F., Naval and Army helicopter pilots over the jungles of Malaya and Borneo. It is my intention to recall a few of my experiences but it must be appreciated that many pilots have similar stories to relate, others very different ones.

History

Helicopters have featured in the inventory of the Royal Air Force since 1950, but only in very recent years has their potentiality as short range transport been exploited. Malaysia has been the most fertile area for this development.

In 1948 the emergency in Malaya gave a requirement for casualty evacuation. A small number of dragonflies provided a useful service to the ground troops. They were vulnerable and unreliable and often had to be escorted by Army Austers.

Soon their effectiveness as a mode of transport in jungle terrain became apparent. The end of the emergency found two R.A.F. helicopter squadrons at Kuala Lumpur Nos. 194 and 155 squadrons. The communist terrorists frustrated and decimated, retired to lick their wounds, mostly beyond the southern boundary of Thailand or deep into the jungles of Malaya. In 1959 these two squadrons were amalgamated to form 110 squadron which then moved to Butterworth.

When I was appointed to command 110 in December, 1962, it was equipped with Sycamore XIVs. The bulk of the work was in support of the Malay Police Field Force and a few Commonwealth troops deployed in the jungle. Patrolling and following up reports, they were attempting to track down the remaining Communist Terrorists.

Anti-Communist Terrorists Operations

One large scale anti-terrorist operation in Malaya, involving a force of over one thousand ground troops including Malay and Thai Police was mounted to seek out a band of Communist Terrorists (C.T.s) just across the Thai Border. Three Sycamores and a Belvedere were detached to KROH, the joint HQ for the operation. A Communist informer was used to guide the ground force to a camp which was supposed to be the hide-out of a large C.T. band, but he wandered aimlessly around in circles and nothing was found. More by chance two C.T.s from a nearby village were captured and one shot whilst trying to escape. Possibly due to a security leak, the birds had flown before the attack could be launched. However the

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helicopters were well used in a variety of roles in an area which from a height closely resembled the surface of the moon, or a green cauliflower. The number of C.T.s still at large in Malaya and Thailand is quoted as anything from 500 - 2000 and could again become a menace.

The Fort Express

One of the most interesting tasks, the Fort Express, entailed flying the English doctor, Dr. Malcolm Bolton, on his monthly round of the aborigine posts. This took anything from three days to two weeks depending on the weather and landing at some 50 different jungle clearings. This was an occasion for the aborigines who travelled miles on foot to see the doctor and of course the helicopter. Having treated the minor cases we flew out the serious ones to hospital or to the nearest fixed wing strip where they were transferred to a Pioneer of the R.M.A.F. Cases varied from snake-bites to leprosy but the more common ones were malnutrition and T.B.

The Sycamore

Flying a Sycamore over the jungle was a real challenge mainly because of its limited power margin. Working most of the time at or near the Maximum All Up Weight one had to make a careful assessment of the power available depending on the temperature, height, the wind and the size and shape of the clearing, etc., before committing oneself to landing. Apart from the dangers of over-pitching or developing a vortex ring state and ending up in a smouldering heap there was also the risk of ground resonance on touch down and shaking the aircraft to bits. The sheer hard work of moving the controls and the vibration on this aircraft made every hour worth five on a more modern helicopter. Despite these problems and the frequent gamble with the weather I never experienced difficulty in finding a keen aviator in the crewroom ready to tackle any task that arose.

BORNEO

Within a week of taking command of 110 the Brunei revolt broke out. After much preparation, briefing and waiting we were called to despatch three Sycamores to Brunei. Two Beverleys loaded with these aircraft and their crews took off from Butterworth at 11.45 p.m. on Christmas Eve, 1962. These were off-loaded at Labuan reassembled and flying on operations the following day. The pilots were flying out of radio contact throughout the daylight hours with a limited dispersal of fuel stocks in a strange country with maps which were but pieces of white paper showing rivers and coastlines in black with a few artist impressions of mountain ranges, some real, some imaginary or shown in the wrong places. Several areas were left blank and some villages and airstrips were as much as 8 miles in error.

Following experiences in Malaya certain main routes were adhered to at the expense of extra flying time. New pilots were checked out on these and later used them as a basis from which to explore new areas. One jungle is much like another but in contrast to the many small clearings cut into the trees in Malaya, most of the early landing sites in Borneo were football pitches. Whereas I never saw one being

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TYPICAL BORNEO JUNGLE

Flying out of radio contact one jungle is very much like another. Maps are like pieces of white paper showing rivers and coastlines in black with a few artists impressions of mountain ranges, some real, some imaginary or shown in the wrong places.

(Crown Copyright Photo)

used for football most long houses boasted a football pitch as a kind of status symbol.

Gradually the tasking took us further afield and the risk of being forced down in the jungle with little chance of being rescued was increasing. As luck would have it the only Sycamore to suffer engine failure came down in the Trusan Valley and the pilot would have landed safely had it not been for another Sycamore sitting in the only available clearing. The pilot was forced to land amongst some sawn-off tree stumps and the aircraft gently rolled on to its side.

Incursions

June, 1963, hailed the arrival of the Whirlwind X, with its extra lift capability.

With further threats from Soekano the cold war began to hot up. In addition to a skirmish near Sepulot in Sabah, when some of the aircraft were shot up, there were several other incursions. The troops had an enormous task in policing 1000 miles of border with Indonesia. Necessarily they were thin on the ground, however by cutting clearings nearer and nearer to the border they were able to get in and out

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and be resupplied by helicopter. Also in the case of an incursion it was possible to put troops into cut-off positions at short notice.

One aircraft was hit whilst searching for some troops who had been out of radio contact for several days. A bullet passed through the window 9 inches behind the pilot's head.

The time had come to take defensive precautions! These included removing day glow strips, flying with two pilots when proceeding within 2 miles of the border, armoured plate in the seat wells, the wearing of flak vests and the addition of mounted bren-guns manned by R.A.F. Regiment gunners. Where possible aircraft travelled in pairs providing cover for each other.

Tawau

The next action came when 110 detachment at Tawau was positioning troops to encircle a band of Indonesians: the latter attacked and killed or wounded over 20 Malay Troops at Kalabakan.

The Director of Operation Borneo signalled for the assistance of one of the Ghurka Brigades on stand-by in Malay. Within 24 hours the transport aircraft were landing at Labuan at the rate of one per hour and this was maintained throughout the night. Beverleys lifted them straight on to Tawau. Their feet hardly touched the tarmac before they had disappeared into the jungle en-route to relieve the hard pressed 110 detachment. In a matter of weeks nearly every one of the Indonesian band had been accounted for. I vividly recollect marshalling in the first Whirlwind with a pile of mutilated bodies from Kalabakan. Political detainees were made to offload them on to a police truck but we were left to clean up the remaining blood from the cabin floor.

Intelligence sources considered that one of the Indonesian bands had proceeded northwards to attack Sandaakan. We were tasked to fly in the maximum number of troops to a cut-off position. With the heavy jungle mist early in the morning and thunderstorms over the Bassey Range soon after midday, we could only manage one lift per day using the only two Whirlwinds available. This was one of the many occasions when we had to break all the rules, stripping the aircraft of armour, crew, etc., and flying with the minimum possible fuel. It was a round trip of 150 miles over real tiger country and we managed to carry 15 armed troops after weighing each one with his kit. It was felt that a party of 15 could at least put up a one night stand until the next contingent arrived.

The bulk of our work was trooping—flying in refreshed troops and pulling out tired jungle worn troops white faced and bearded—some decidedly sick who had been patrolling in the jungle for 2 or 3 months. It gave us great satisfaction to land in a clearing and see the excitement of these chaps—throwing their caps in the air. As I loaded at one clearing, very near the Indonesian border, I was confronted with a huge sign post which read "To London 8,165 miles".

Sabah Radio

Apart from the routine tasks there were the occasional jobs which presented a different kind of challenge. Carrying VIPs such as the Minister of Defence, The

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Sultan of Brunei, etc. Sabah Radio gave us one interesting job when in order to improve their poor radio coverage they planned to build a transmitting station and associated power house 9,500 feet up Mount Kinabalu, the highest mountain in the S.E. Asia. I flew up the first reconnaissance party and after waiting some time for the cloud to clear, we landed on the 6,500 feet Landing Zone at the top of the road-head only to experience a change of wind which brought the cloud down in a matter of seconds. From 11 a.m. we were stranded until 5.30 p.m. when it suddenly cleared. We reconnoitred the route to the top and gave instruction for the preparation of the Landing Zones. Some months later when all was ready Flt. Lt. Chunky Lord flew dozens of sorties in a stripped-down Whirlwind X altogether lifting many tons of freight including very expensive radio parts and switchgear.

Army Survey

Master Pilot Eric Leydon set off with an Army survey team whose job it was to fix certain known points in relation to one another so that the air photographs, which had taken the P.R. detachment over 8 years to get owing to persistent cloud cover in certain areas, could be lined up in order to make better maps. The pin-points for the ground survey were all high features and many were inaccessible because of the trees. The technique used entailed lowering a man with a power saw by winch on to a ledge or through the nearest gap in the trees. The minimum number of trees were then felled to enable the Whirlwind to be balanced precariously on perhaps one or two wheels whilst the other members were off loaded along with their theodolites, etc. Three trig points had to be simultaneously manned in order that measurements could be made, then the rear crew was taken forward to the next point in leap-frog style, until most of Sabah and Sarawak was covered. The whole job was completed within a matter of weeks compared to perhaps several years by surface means.

Hearts and Minds

On a space available basis much was done for the local inhabitants who quickly lost their apprehension of the helicopters and made good use of this novel form of transport. The military depended to a large extent on the loyalty of these people for information concerning "Strangers in the area". As in the Malayan Emergency some of the locals living near the border were moved back to safety. Complete long houses including the building materials, men, women, children, pigs and chickens, rice and valuables were transported in helicopters to other areas.

Singapore and S. Malaya

The tour on 110 was an accompanied one and to make life bearable for the families a monthly rotation was kept up. Back at Seletar where the Squadron HQ had now moved things were warming up; riots in Singapore, parachutists being dropped in Johore Bahru at Labis and seaborne landings at Pontian. Helicopters played their full part in all these operations. At Labis Army, Naval and R.A.F. helicopters took part under the central control of a B.A.S.O. working with the Army

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Commander. The rapid deployment by helicopters enabled our troops to isolate and in time account for all the Indonesians dropped. Similarly at Pontian with the assistance of airstrikes by Hunters and voice broadcasting by Pioneers the terrorists were demoralized and rounded up.

Conclusion

Whereas in the case of the French it was Algiers, the Americans Vietnam for the British it took the troubles in Malaysia to hammer home the invaluable asset which the helicopter can be in hot or cold wars in difficult terrain. I submit that it would have been impossible to effectively police the 1000 miles of Indonesian border in Borneo without helicopter support unless ten or twenty times the number of ground troops had been used. During my tour I am pleased to report that no passenger was hurt and no one was fatally injured. This surely proves that the modern helicopter can be a safe and effective means of transport. It was most fitting that last December the squadron was presented with a Standard by the Commander-in-Chief Far East.

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1st Page with *single* line title	490
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2 Page article, therefore	1,092
3 Page „ „	1,694
4 Page „ „	2,296
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Deduct from above totals: —

For double-line title	38
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THE ANATOMY OF COMMUNISM

By Air Marshal Sir Robert Saundby, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L.

ONE of the greatest threats to the democracies of the Free World is the inability of many people to understand the basic nature of Communism, to realize its unalterable aims, and to recognize the ways in which it works to attain its ends. They are inclined to think of it as merely a rather extreme form of Socialism, and unlike Fascism—which is feared and detested—to accept it as just another political party.

This is, of course, exactly what the Communists want us to think. They themselves are careful to avoid the word Communism, and Russia is officially called the Union of Soviet Socialist Republics. Harry Pollitt, the British Communist leader, once said "What is there to be afraid of in Communism? It is only Socialism with its working clothes on."

The object of this article is to analyse the origin, structure, and aims of Communism, and to show that it can never be an acceptable alternative political party in a free democracy. I use the phrase "free democracy" because the Communists, with characteristic effrontery, have adopted the term "people's democracy" to describe their system of totalitarian rule by a small self-appointed oligarchy.

Communism, in the true sense of the word, means a system whereby the available goods and services are shared by all alike. There can be no private property, no buying or selling, no money, and no bartering. True Communism has existed for centuries in monastic institutions, and still exists in many today. It requires a firm discipline, and a dedicated and selfless existence. It is therefore totally impracticable except in very small isolated communities. Communism, as we know it today, is quite different. It is really a form of State Syndicalism, a system in which all property is vested in the State, which is all-powerful. The State, or more accurately the small self- appointed group that rules the State, controls everything, including all media of communication; plans everything; and issues decrees which have the force of law. The body that does duty for a Parliament, elected from a single-party list of candidates, meets at infrequent intervals and merely "rubber-stamps" these decrees.

The first Communist State arose as a result of the Russian revolution in 1917. In its earliest form it was idealistic, and tried to put into effect many of the tenets of true Communism. Unfortunately it was tinged with the Anarchism and Nihilism that had been the basic creeds of Russian revolutionaries for many generations,

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which aimed at the destruction of all existing organizations and institutions, including the Government itself. For this reason the emphasis was on destruction, and very little that was constructive was attempted. The resulting chaos gave the Communist Party an excuse for setting up a strong central dictatorship, in order to bring back some semblance of law and order. Because the vast majority of Russians were peasants engaged in subsistence farming, the countryside on the whole did not suffer too much, but in the towns unemployment and starvation reached dangerous levels. The local Soviets, acting on instructions from the Supreme Soviet in the Kremlin, organized State factories and shops, while peasant farmers were ordered to hand over a proportion of their produce to feed the townsfolk.

So much had been destroyed, so much had to be built anew, and so many educated people had been liquidated, that for a long time the standard of living in the Soviet Union was appallingly low. But every man and woman was driven on to work endlessly and desperately, under the threat of savage penalties and inspired by promises of a new golden age in the future.

There were, indeed, a few compensations, especially for the townspeople. Landlords, property-owners, and merchants had been dispossessed and often murdered, and all men were, in theory at least, equal. But it was soon apparent that all official posts, and there were many, were filled only by members of the Communist Party. There might be elections, but only one Party — the Communist Party — could nominate candidates. There were some dissident groups in the Party, notably the Trotskyists, but they were soon liquidated.

The Russian people were used to being pushed around by a bureaucracy, but in Tsarist days many officials were venial, lazy and inefficient. Their tyranny was therefore far less onerous than that of the new bureaucracy, which was tough, ruthless, and, as time went by, more and more efficient. In these circumstances, it was necessary for the Government to control all sources of information. It was essential to make the Russian people believe that, bad as their conditions might be, the rest of the world was even worse off. It was essential to keep alive the hope of better things, by stressing the wonderful achievements of the Government and promising that a golden future was just over the horizon. It was vital to make the Russian people believe that all the Free World was hostile to them, and that most of their sufferings were due to the wicked acts of foreign countries. Planning and administrative failures, which often were unavoidable in the prevailing conditions, were branded as sabotage instigated from abroad, and many innocent and hard-working bureaucrats were tried and executed.

In the early years great emphasis was placed on the building up of the Soviet armed forces, supported by a rapidly expanding heavy industry. The vast sums required were justified by the myth that the U.S.S.R. was encircled by powerful and hostile countries, only waiting the chance to invade, plunder, and destroy. Some colour was given to this by the abortive military intervention in 1919 by certain Western Powers in aid of the counter-revolutionary activities of the so-called White Russians.

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The Communist leaders saw clearly that it would require a long time—at least several generations—to overtake or even equal the standard of living of the Capitalist countries. During that period the Russians must, as far as possible, be kept in ignorance of the world beyond their frontiers. So all contacts with other countries were restricted to trusted officials, and efforts to prevent foreign books, broadcasts and newspapers from reaching the people were redoubled.

Some thirty years after the Revolution the Communist leaders were faced with the need for making a decision of the utmost importance for the future. By that time their output of machinery had become considerable. Locomotives, lorries, farm tractors, cultivators and other machines were in the hands of ignorant people who had little idea of how to use them properly, service them, or repair them. It seemed inevitable that if the U.S.S.R. were to progress further, and succeed in raising the standard of living, a vast programme of technical education would have to be put in hand. But if this were done a large number of trained technicians—indeed, a whole new technocracy—would come into being, threatening the hitherto unchallenged supremacy of the Kremlin and its bureaucracy. Would it be possible to go on deceiving the people as to the true state of the U.S.S.R. compared to the Capitalist world, and if not, what would be the result? Would not Government propaganda be discredited and all sorts of undesirable consequences follow, such as demands for greater freedom of thought, or even of speech and action?

It was a difficult decision to make, for upon it would depend the whole future of the Communist Party and the U.S.S.R.

In the end there was really no choice. Those responsible for production and reconditioning said firmly that they could not go on making machines to be abused and damaged, even destroyed, by ignorant operators. It was said that the life of a farm tractor, for example, was absurdly short because no one on the farm knew how to use it properly, or to use the spares provided to replace worn parts in time to avoid a complete breakdown. So it was decided to create a large number of technical schools and colleges, and to train a huge corps of teachers. This was a massive undertaking, with so little to build upon, and many years were to pass before a significant number of trained technicians were available to operate and service the machines. Even today, the amount of power available per head of the population is very low by Capitalist standards.

The history of Communism in China has followed a similar pattern. The people have not yet outgrown the period of enthusiastic idealism; they are still almost completely ignorant of conditions in other countries, and live in a dream-world manufactured by their rulers.

The social and civic achievements of Russian Communism should not be under-estimated. There has been a tremendous building programme to produce houses, flats, health centres, stadiums, parks and playgrounds. The old palaces of the Royal Family, the nobles, and the wealthy have been turned into Palaces of Rest and Culture for the people. Travel, which used to be indescribably difficult and uncomfortable in the early years of the Revolution, has been vastly improved. There

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is great emphasis on the health service, largely administered by women doctors. Since strikes and industrial disputes are not allowed, trade unions are mainly welfare organizations. Religious activities, though not encouraged, are no longer prohibited.

Much that is bad in our Western civilization has been suppressed or eliminated. There is less juvenile delinquency, less violent crime, less gambling and less drunkenness. Pop music, semi-nudist exhibitionism, and the modern daft, morbid, and obscene trends in painting, sculpture, literature, drama and poetry are frowned on by the authorities. Signs are not lacking however, of a tendency among the younger generation to be tempted by these things, and it may become increasingly hard to suppress them. The advertizing industry, so all-pervading a feature of the Western way of life, scarcely exists in Russia and Red China.

The people, conditioned by decades of unceasing propaganda, are in the main contented. They are peace-loving—as indeed are all civilized peoples if they are allowed to be so—and could only be brought to support a war if they believed that they were being seriously threatened or attacked. If the Government decided upon aggressive war, it would be necessary to persuade their people that they were being attacked. That might not be too difficult, since all Communist governments have the power to select the information given to their peoples. As time goes on, however, this becomes increasingly difficult, and we are approaching the point in Russia at which it is becoming virtually impossible.

In one way this does not matter so much, as the disparity between the Russian and Capitalist standards of living is nowadays not so great. But it is still important for the Kremlin to maintain the myth of Capitalist greed, malevolence, and aggressive bellicosity. Russia, now the greatest Imperial Power on earth, must distract attention from this fact by always branding the Capitalist Powers as Imperialists and Neo-Colonialists. History is freely falsified in Russian school books, and everything possible done to make the U.S.S.R. appear as the apostle of peace in a world of warmongers. This image is becoming somewhat damaged by the Chinese claims to be the apostle of peace, deriding the Russians as collaborators with the Capitalist Powers in a world-wide Imperialist conspiracy.

The basic underlying principle of modern Communism, or State Syndicalism, is that the ruling oligarchy is omniscient and omnipotent, planning and ordering the lives of the whole population. Since it is a primary article of Communist faith that all social and economic problems can be solved by political action, any opposition to the ruling body is unreasonable and reprehensible. They believe that everyone wants —or ought to want—the same things, and since they, and they alone, understand how to provide these things, nothing must be allowed to stand in their way. No opposition can therefore be tolerated, and all who refuse to co-operate fully with the Government are clearly anti-social, unpatriotic, and even criminal. They are standing between the people and the desired Utopia. It is therefore not only desirable but essential to liquidate them. This arrogant assumption by the ruling clique that it alone can be right, and all who oppose it must be wrong and wicked, is one of the most permanent of all Communist doctrines.

It is possible for a Communist government, like that of Jugoslavia, to be harmless and unaggressive, and to live in peace with all nations. But the majority, including

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the U.S.S.R. and Red China, are dedicated to the spread of Communism by every means in their power. It is this unalterable policy which makes them so dangerous a threat to the Free World and its way of life.

The Communists believe that their system and the Capitalist system are diametrically opposed, and that no compromise between them is possible. In this view they are undoubtedly right, and it would be a good thing if this fact were more widely understood in the West. But peaceful co-existence would be possible if they would give up the idea of extending their system to include the whole world. They believe, however, that one or other system must in the end prevail, and they are determined that Communism shall be victorious.

Both Russia and Red China believe this, but they differ as to ways and means. Both know that no peoples anywhere will willingly accept Communism, and therefore its rule must be extended by force or fraud. Lenin laid down that the Communist victory could be achieved only by force of arms, by direct physical imposition. For a long time the Russians believed this, and indeed they took the opportunity, during and after the Second World War, to impose Communism by force of arms on East Germany, Poland, Bulgaria, Hungary, Rumania, Czechoslovakia, Latvia, Esthonia and Lithuania. Wherever the Red Army managed to get, with the exception of part of Austria, it stayed and ensured the setting up and maintenance of Communist governments. The formation of NATO with the backing of American nuclear power put a stop to this process, and the Russians no longer rely on force to extend their domination. But they do everything they can to make mischief between the Western Powers, and if NATO were to fail and break up, they would be tempted to revert to the use of force. Red China, with less understanding of modern world conditions, still regards force as the best and quickest—perhaps the only—way of ensuring the spread of Communism in the Far East.

In passing, it is interesting to note that it was their strategic situation that compelled the Russians to concentrate on very long-range rocket missiles. The Americans, by using a large number of bases in various NATO countries, could reach any target in Russia by means of rocket missiles with a range of 2000 miles or less. They therefore tended to concentrate on producing a great quantity of smaller, cheaper missiles. The Russians, on the other hand, though they could reach any European country by using similar missiles, realized that this could neither produce decisive results nor deter the Americans from using their nuclear power. In order to do this, they had to be able to deliver their nuclear weapons on targets in the United States itself, and threaten the Americans with total destruction. This could be done only by means of very expensive long-range ballistic missiles, or by shorter ranged missiles launched from enormously expensive nuclear-powered submarines. They have developed both methods, but at first put most of their effort into producing very powerful rockets. It was this which gave them, for a time, a spectacular lead in the exploration of space, for which very large rockets are needed. They have cashed in on this necessity by giving the maximum publicity to their achievements in space, and have endeavoured, with a good deal of success, to impress the so-called uncommitted nations with Russian scientific prowess and military might.

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A nuclear stalemate has now been created which makes full-scale war unthinkable. The Russians, therefore, have given up for the time being the idea of spreading Communism by force of arms, and have resorted to what is known as the "cold war". Under cover of a cloak of peaceful co-existence they use every means short of force to gain their ends. They take advantage of the freedoms of genuine democracy to infiltrate into left-wing political parties. They try to gain control of pacifist and religious organizations, and exploit the good-will of well-meaning but foolish people, and the ardour and ignorance of youth. They make use of anyone with a genuine grievance against the authorities. In order to increase economic difficulties and foster class-warfare they do their best to infiltrate into trade unions. They abuse the democratic freedoms of the Press and of speech to maintain a subtle, skilfully directed, and world-wide system of propaganda.

By these means they hope to gain power through the ballot-box. Of course, they know very well that they have little hope of doing so as Communists. No candidate standing for election to Parliament as a Communist in this country would have much chance of success, for only two Communist members have ever been elected. Their hope lies in Communist-infiltrated liberal and socialist Parties. Once they have gained access to the levers of power they can stage a political coup, and then reform the electoral system to make sure that no other Party can ever nominate a candidate for election to Parliament.

The free democracies are ill-equipped to deal with the cold war, because most of the counter-measures open to them would erode the very freedoms that differentiate them from the Communist totalitarian states. This is their dilemma, and so far no satisfactory solution of it has been found. One reason for this is that the governments and peoples of the free democracies are in the main tolerant and inoffensive, and find it hard to believe that others are not equally so. Even when subversive Communist activities are unmasked, they do not take the matter very seriously. They feel too secure to be threatened by anything short of superior armed force, and believe that "it couldn't happen here." They do not, as I said at the beginning of this article, understand the real nature of Communism.

In this country the number of those holding Communist Party tickets is insignificant, but there are very large numbers of liberal-minded and progressive people who lend themselves, for the most part unconsciously, to the furtherance of Communist aims. They form a vast unwitting fifth column. Deprived of their support the Communists, like the Fascists, could make but little headway.

The supreme irony of the situation lies in the fact that, if a Communist government should ever seize power in this country, these liberal-minded and progressive individuals would be among the first to be liquidated.

The most useful step that could be taken would be to open the eyes of these people to the true state of affairs, but this, alas, is far more easily said than done. In forty years Communist propaganda in Britain has done its work only too well, and has succeeded in creating a permanent phantasmagoria in which the only villains in the world are to be found in South Africa, Spain, Portugal, Rhodesia, and the deep south of the United States.

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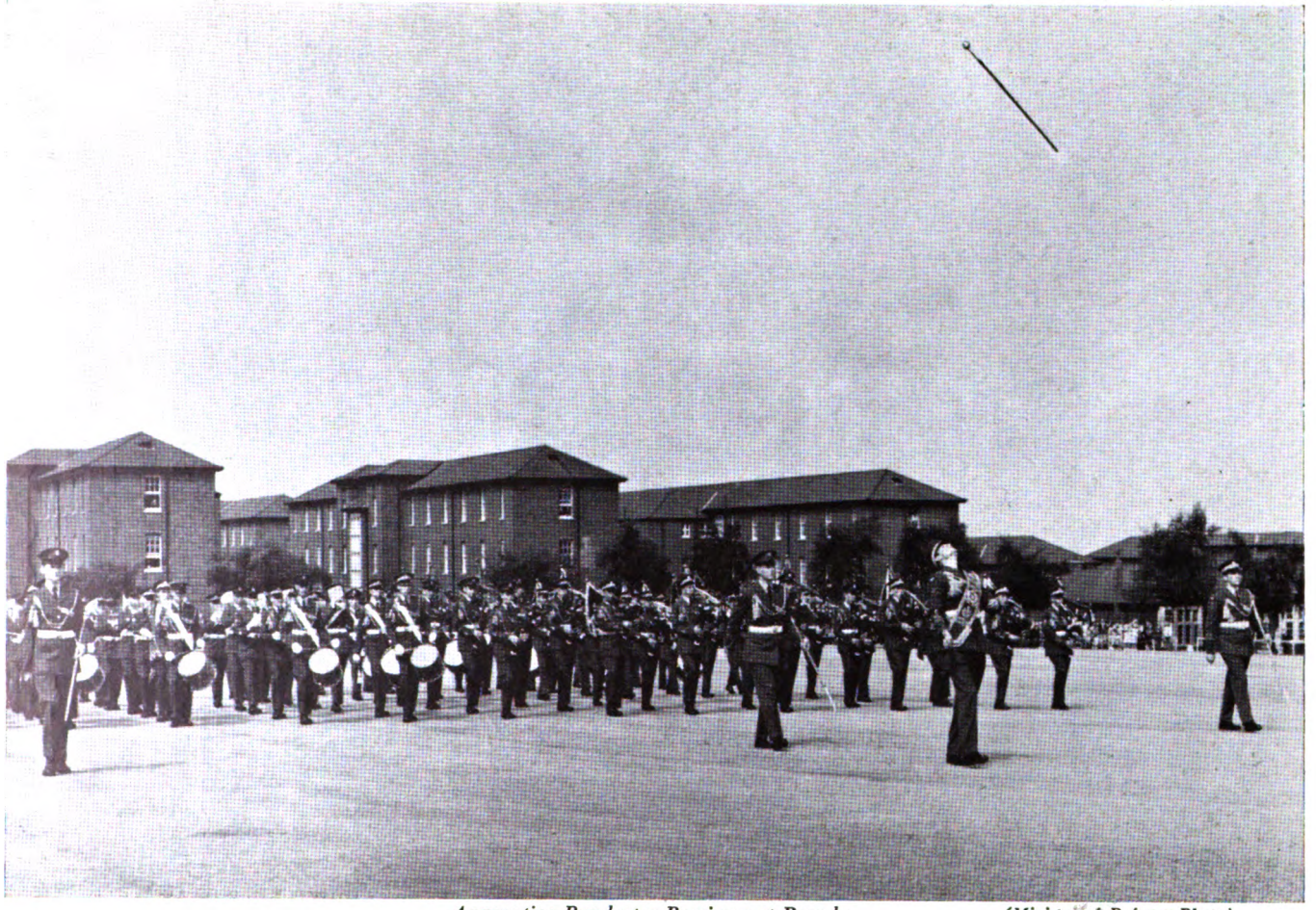

Apprentice Band at a Passing-out Parade (Ministry of Defence Photo)

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Technical Training Command Today

By

Air Marshal Sir Donald R. Evans, K.B.E., C.B., D.F.C.

Air Officer Commanding-in-Chief

THE most important job of Technical Training Command is to give initial training, both general service and technical, to everybody who comes into the Royal Air Force—excepting aircrew and one or two other categories. But this is only part of the job for, later in their careers, large numbers of airmen return to the Command for further training to gain extra qualifications or to enable them to look after more complicated equipment or undertake specialist jobs.

Training then, as the reader would expect, is the main responsibility but the Command also administers a large number of miscellaneous units such as the RAF Headquarters Unit at Kenley which has between three and four thousand people on its books; these are mostly in London but they are located also in a variety of places overseas—in NATO, CENTO and SEATO, at Woomera in Australia, in Embassies and so on. The Central Medical Establishment, some hospitals, the Medical Rehabilitation Units at Headley Court and Chessington, the Transient Families Unit, the Music Services and the Queen's Colour Squadron at Uxbridge are also administered by the Command.

The Command therefore is a large one with some twenty-three thousand service and civilian personnel on its books at any one time. In addition to these, and as a somewhat sordid sideline, everyone who ever deserted from the Service is on the books of the RAF Police Depot at Debden. These deserters are picked up from time to time and, when they are, they are dealt with by the Command. Technical Training Command is responsible for some 25 stations in the United Kingdom together with the administration of the Careers Information Centres: a total of some 65 locations. The last major statistic: 25,000 trainees pass out from the Command courses each year, including 400 from the Commonwealth and foreign countries.

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THE GROUPS

The higher organisation of the Command is straight-forward. There are two "Hollinghursted" Groups, Numbers 22 and 24 Groups and one organisation of Group status, the Royal Air Force Record and Pay Office Group at Gloucester which, like the miscellaneous units, is under the Command only for administration. Until recently there was also the RAF Technical College Group which has, of course, now been merged with Cranwell.

No. 24 Group at Rudloe Manor is responsible for training in all strictly technical trades. The Group has five main training stations—Halton, Locking (Somerset), Cosford (Shropshire), St. Athan (Cardiff) and Newton (Notts.). In broad terms Halton specialises in training apprentices in aircraft engineering, Locking and Cosford in training both apprentices and adults in electronic engineering (ground and air respectively), St. Athan in training adults in aircraft engineering and MT, and Newton in training adults in electrics, instruments and guided weapons. Between them the 24 Group schools run 206 different kinds of courses.

No. 22 Group at Market Drayton is numerically rather smaller than 24 Group but it has more stations and its activities are more varied. It has the Officer Cadet Training Unit at Feltwell for men and women officers of the ground branches to many of whom it later gives specialist training in their professional jobs. It has recruit training for airmen at Swinderby and Hemswell, and for airwomen at Spitalgate. And it gives professional training to apprentices and adults in a variety of non-technical trades including clerks, suppliers, police and caterers. It also looks after most of the miscellaneous units. The 22 Group schools run 72 different kinds of courses.

THE JOB

The training task can be divided into Apprentice Training, Airmen and Airwomen Training and Officer Training.

Apprentice Training

The old Apprentice cum Boy Entrant Scheme is being phased out and will not be discussed; the last of the old type of apprentice will pass out in December. Under the new scheme, which was introduced in October 1964, there are apprentices only, who are selected at the Youth Selection Centre Stafford, and they come in three kinds. There are Technician Apprentices who must have 4 'O' levels on entry. These do a three year course and are broadly trained in either aircraft engineering, air electronic engineering or ground electronic engineering. The idea is that they should be trained to diagnose and rectify faults in complicated weapons systems which have closely inter-related components. They will normally pass out as Corporals. Then there are Craft Apprentices in the technical trades who must have a good secondary education. They do two years, and they are not so broadly trained as the Technicians passing out as fitters in one of nine fitter trades—normally as Junior Technicians.

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H.R.H. Princess Alexandra Inspecting Apprentice Band

And lastly there are other Craft Apprentices and Administrative Apprentices who do one year. They provide the telegraphists, photographers, cooks, nursing attendants, clerks and suppliers. All apprentices come in between 15½ and 17½ (the exact ages depending on what they are to become). They serve initially on a nine or twelve year engagement. The Command is taking in about fifteen hundred a year and they are certainly very good material. These boys are all trained at Halton, Locking, Cosford or Hereford depending on their trades.

Recruit Training

Adult RAF recruits are coming in at just over four thousand a year at the time of writing (December 1965), although the target is nearer seven thousand. An adult recruit is anyone between the age of 17 and 38. 80% of those who come in are in fact under 21. They arrive at the recruit school at Swinderby a batch every week. The School has them for seven weeks, and during this time they are expected to turn them into airmen and then most of them pass on to a Technical Training School for trade training. The quality of the recruits is good, and the shortfalls are mostly in the trades of steward, supplier, clerk, nursing attendant and as trade assistant general. Airmen serving as adults sign on initially for five or nine years. The WRAF after acceptance go to the WRAF Depot at Spitalgate for their recruit training which also lasts seven weeks before they pass on to a Technical Training School. They sign on for four or six years initially but because of marriage the statistical WRAF usually lasts about two years.

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Other Airman Training

Everything that has been mentioned so far has been basic training, but this is not the last that the Command sees of many of these airmen for large numbers return to Technical Training Schools for,

Further Training to up-grade, for example, a mechanic to a fitter. There is a large back-log of these which will last some years.

Conversion Training to convert from one of the old narrow trades to a broader one.

What the Command calls Post Graduate Training on advanced or new equipment at the Command schools, or at Manufacturers courses under the Command's control.

Management Training for Senior NCO's of whom about two thousand a year pass through the School of Management and Work Study at Upwood (which gives courses also to officers).

It can be seen that by the time an airman has reached the top of his career he may have been given recruit training, basic and advanced technical training, possibly conversion and post graduate training, and finally management training all within Technical Training Command. For some time now strenuous efforts have been made, with fair success, to reduce the numbers of airmen who return to Technical Training Command for a course—for time spent in the Command is time out of the front-line.

Officer Training

Perhaps the most important unit in the Command is the Officer Cadet Training Unit, which is planned to pass out nine hundred junior officers each year. The importance of the OCTU may be measured from the fact that it is the ex-OCTU officer who directly officers a very large proportion of the airmen and airwomen in the Service. Also, because in many cases the professional course which he attends on leaving the OCTU is short and concentrated (the Secretarial Officers' Course is only nine weeks), his initial officer training is virtually completed at the OCTU. This contrasts with the young GD officer whose officer training may be continued through his relatively long flying training. With these points in mind steps were recently taken to extend and improve the OCTU course. It was agreed that the main course should be extended from twelve to sixteen weeks; and that a lead-in course of eight weeks should be introduced for young men under 22, thus following a practice which has shown itself effective with the younger WRAF's. The young man or woman is thus able to shake down during the lead-in period before the pressure comes on during the course proper. The other major change is that the OCTU is to move this Spring and Summer from rather inadequate accommodation at Feltwell to Henlow, where it will occupy the College buildings previously used by the Cadets of the RAF Technical College who are now at Cranwell.

After his OCTU course, the young officer moves on for his professional training (or if he is already trained, to learn RAF practices)—to Upwood (Secretarial, Equipment and Education), to Cranwell (Technical), to Halton (Medical and Dental), to

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Debden (Provost), to St. Athan (PFO) or to Hereford (Catering). Newly commissioned aircrew (non-commissioned aircrew do the OCTU course) go direct to Squadrons. This is a suitable place to put in a strong plea to readers who may receive these newly commissioned officers when they arrive at units. Perhaps they would remember that despite the lengthened course, it is still very short; and that there is therefore an important responsibility on the Stations to continue training the new officer on the job—not just in his specialisation but in his duties as an officer.

THE STATIONS

The Command is well advanced in an extensive redeployment programme which aims first to reduce the number of stations; as a result the number of training stations is now twelve compared with twenty-one five years ago. Secondly, to concentrate training by trades instead of by type of trainee; thus No. 1 Radio School, Locking, now trains not only apprentices in ground electronic engineering, but also every class of adult—thereby saving on overheads such as expensive training equipment. And thirdly, to vacate (at last) the old hutted camps such as Yatesbury, Compton Bassett, Melksham and Weeton which cost £100,000 a year to maintain and to extend and to build modern permanent accommodation on, the long term stations such as Cosford, Locking, Hereford, St. Athan and Newton.

Halton is a special case since the original Trenchard buildings of the 1920's were so well constructed that they can hardly be knocked down and replaced by modern ones. However they are being modernised and certain new accommodation is being provided as well. This redeployment is quite an operation, since it means not only obtaining authority for the planning and the construction of the buildings and the usual trouble with certain contractors, but also first class work on the part of commanders and staffs if training is to be moved from Station 'A' to Station 'B'—together with instructors, plant and training aids—with the minimum interruption in training. The amalgamation of Flying Training Command and Technical Training Command in 1968 is unlikely to involve any further redeployment of Technical Training Command units or new building, other than the construction of a Headquarters at Brampton.

STANDARDS AND METHODS

There is one fundamental requirement which every level in the Command must keep in the forefront of their minds—and that is the relevance of what is taught in the schools to what is required in the front-line. The Command must turn out not theoretical experts but men to take their place in the servicing organisation—with the emphasis perhaps on quick and accurate diagnosis. There are various arrangements made in the hope of ensuring that this is so, and the operational Commands can of course help by letting Technical Training Command know what is wanted.

Then there is the question of standards, and centred at the Command Headquarters there is the Trade Standards and Trade Testing Organisation which is

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responsible for controlling airmen's promotion examinations and trade testing not only in Technical Training Command but throughout the Service. Following a thorough overhaul of procedures in 1964/65, not only was a more realistic and practical system evolved, but £300,000 was saved in the last year.

Within the Command, Apprentice training is the biggest single commitment, and in 1965 the pass rate rose from 90 per cent to 91 per cent, the 9 per cent who failed including those who fell out following discharge by purchase and for medical and other reasons; the loss through failure in examinations was 2.4 per cent. The overall pass rate for the Command on all types of courses was 93.5 per cent.

It is obvious that every effort must be made to ensure that the training is not only relevant but also interesting, and that the latest techniques are used. As an example, the radio trainee these days is first presented not with a text book, but with the practical problem of building a simple transmitter by plugging components into a board; he can then hear his own voice transmitted and he can see its vibrations on an oscilloscope. This leads him into theory as a living subject rather than as a blackboard exercise. The various text books are being re-written in a form calculated to catch the imagination; and new methods and new types of diagram are being introduced designed to make fault finding easier.

Much work continues on programmed instruction, of which one example is the Teaching Machine. The general idea of this is that a first-class instructor writes a lesson in a manner suited to the system and to the machine. The trainee inserts the lesson into the machine and then plays a sort of game with it answering questions by pushing buttons, and emerges at the end having "taught himself". In this way each trainee—the bright, the average, and the dull—proceeds at his own speed. Programmed instruction may have particular application to Continuation Training when men have often to train on their own, although some supervision is desirable. The main work in these fields is done by the School of Education— and in particular by its research section. Other techniques include closed-circuit television which can have various applications but is less attractive than it might first appear. The School also runs courses for ground instructors and for squadron and flight commanders in the apprentice schools.

TRAINING THE MAN

Finally a word about the man or youth himself. The Command receives its most important material at an impressionable age, and its primary duty is to turn these young men into good airmen and good citizens, as well as into good tradesmen. Therefore throughout their time in the schools much emphasis is put on General Service Training. This includes PT and sport, drill, religious instruction, resource and initiative training, ground defence training and liberal studies. In sport, boys are first introduced to as wide a variety of games as possible and, after this initial phase, they are encouraged to play the game they prefer; and in coaching the aim is to coach the less good as well as the experts. In resource and initiative training

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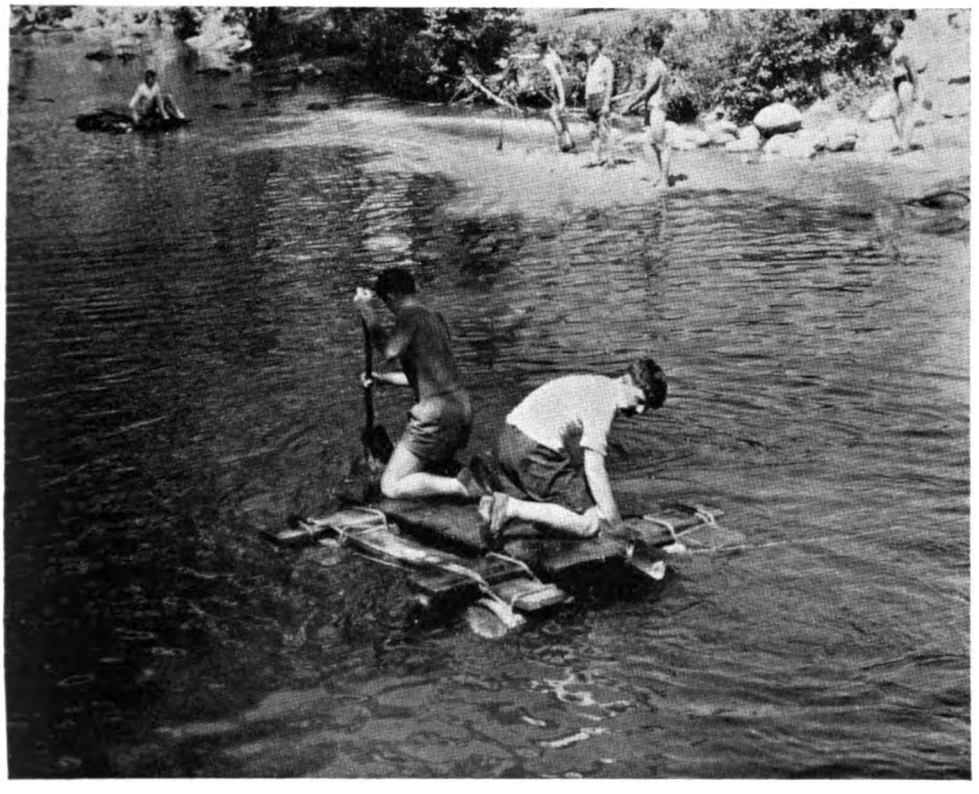

Apprentice Activities — Resource and Initiative Training
(Ministry of Defence Photo)

the boys are sent out into some fairly rugged country, usually in the Welsh Mountains, where they are required to complete various exercises. Other expeditions are undertaken and teams take part, for example, in the Ten Tors Expedition on Dartmoor, the Nijmegen Marches and in the Devizes to Westminster Canoe Race. A large number of boys qualify in the Duke of Edinburgh's Award Scheme.

Perhaps this sketch of what goes on in Technical Training Command can best be concluded with these words which for some years now have been framed and hung in the Commandant's office at Halton:—

> "The aim of Apprentice Training is to produce Advanced Tradesmen of good education and to develop in them such qualities of character, sense of responsibility, leadership and pride of Service as will fit them for a progressive career in the Royal Air Force".

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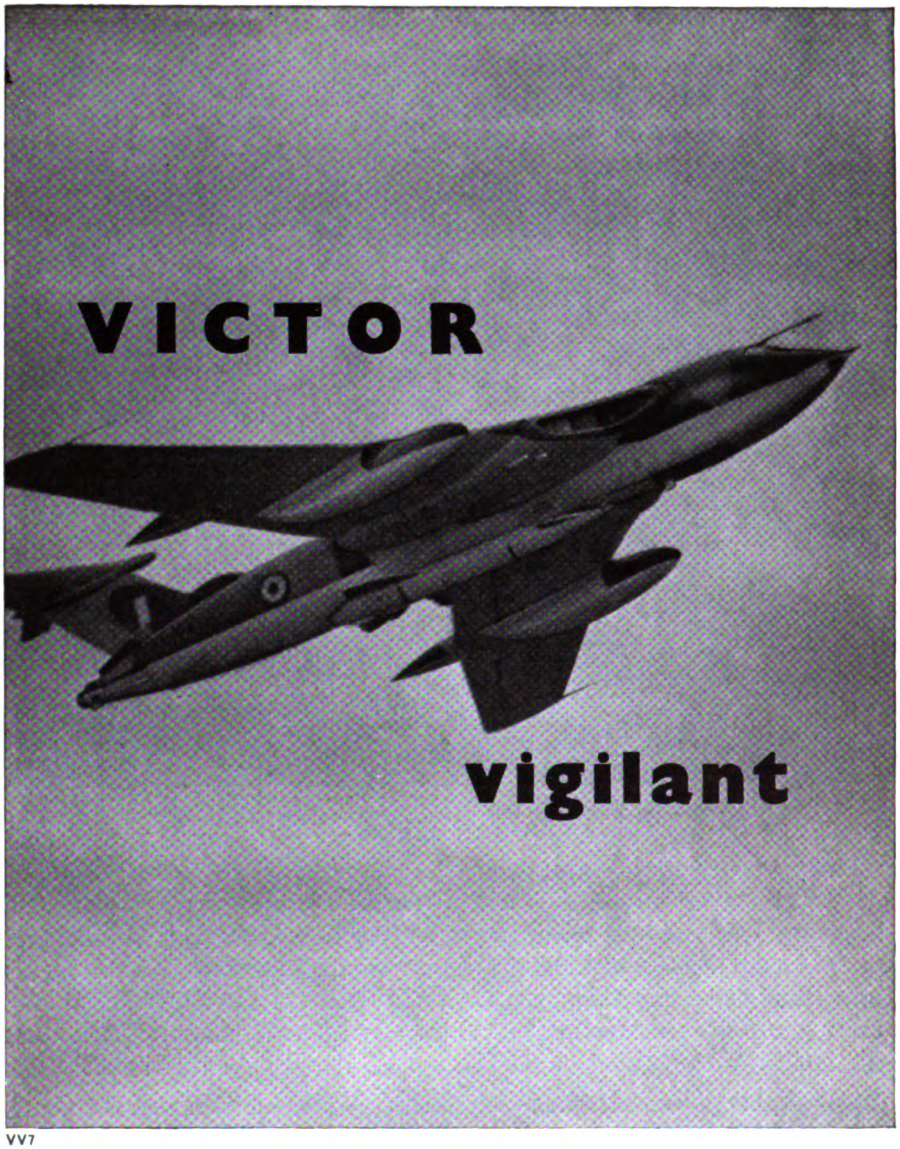

VV7

While the world sleeps or works or plays, Victors are ready—waiting to fill any of their three roles as missile carriers, reconnaissance aircraft or nuclear bombers. A single sortie by four Victors can map the whole of a continent. At three minutes warning Victors can be airborne, retaliating against an aggressor country, carrying weapons with the destructive power of many million tons of TNT. In the face of such a deterrent, sanity decrees that global war is now unthinkable.

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THE ENIGMA OF DEFENCE

By Air Vice-Marshal W. Carter, C.B., D.F.C.

THERE is something almost wistful about the way in which most of us look upon Britain's defence problems nowadays, as if we feel that someone has tricked us into complexities we have not deserved; and in fact the situation contains a mixture of the strange and the true. It is strange because traditionally we have understood better than most nations the correct role of military power in national policy. It is true because, against a long time-scale of history, recent years have brought a flood of military development which has been extremely difficult to contain.

Looking back we can reasonably say that until 1945 we in Britain made classical use of military power in international relations. We recognised it for what it was, a powerful persuader for influencing affairs and events. We saw that if our forces were sufficiently versatile we could use this power far outside the scope of the set-piece war. Thus, we applied it in our political negotiation and bargaining. We displayed and manoeuvred it in the broad sense as both expeditor and deterrent to the actions of other nations. And in the narrower sense of the everyday we used it to pacify areas of trading interest, to suppress rebellious elements and to probe out the strength of potential enemies. In other words, military power was a key factor in our national strength and prestige and we used it well.

There were times over these years when revolutions in warfare caused us, and other nations, to stop and think, for they suggested that either war itself must end or civilisation might collapse. Thus, when nuclear weapons appeared on the scene, they seemed to remove for all time any question of alternatives in this issue: war must stop. Yet, of course, war has not stopped and the long list of fighting, killing and devastation since Hiroshima and Nagasaki is a rather pathetic indicator of man's inability to make the human factor in warfare advance with the weapon factor. We can define this human factor as man's determination to impose his will upon his fellows and his readiness to use force in order to do so. And we can see that whether the weapon has been the club, the sling, the rifle or the nuclear missile, this human factor has not materially changed. Moreover, not only has the nuclear weapon failed to stop war, it has also failed to restrain the development of ever more complex and costly weapons.

We therefore find ourselves in bedevilled circumstances. Military power is still a formidable factor in international affairs and there seems no limit to the complexity and cost of the weapons which can be devised to implement it. Nuclear weapons far from stopping war have virtually encouraged the minor forms of it and,

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POWER

Throughout the world Rolls-Royce aero engines have been chosen for more than 130 airlines and 40 armed forces. They power more jet and propjet airliners currently in service than those of any other engine manufacturer in the world.

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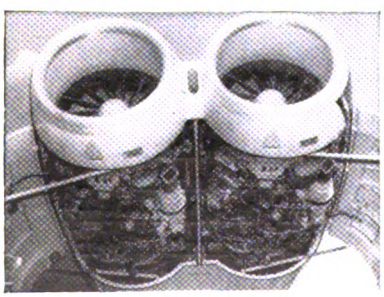
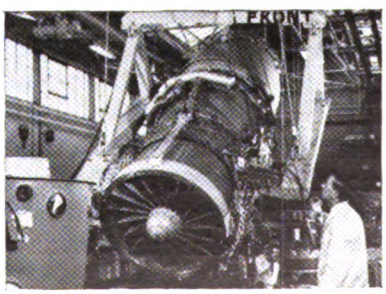
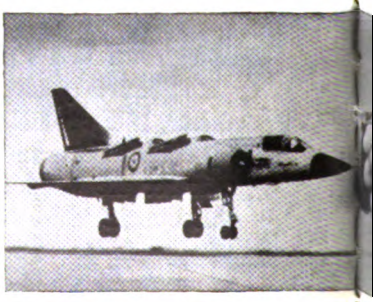


CONWAY TURBOFAN The rear-mounted Conway turbofans powering the Vickers VC10 and Super VC10 are the most powerful jet engines in service with any Western airline. They have been developed from the Conway 12 fitted in the Douglas DC-8/40 and Boeing 707/420 airliners of eight international operators. The Conway 12 has a longer achieved time between overhauls than any other engine in the world – 7,500 hours.



SPEY TURBOFAN Military Speys are in service in the Hawker Siddeley Buccaneer S.2 and have been selected to power the HS.801 and McDonnell Phantom II for the British Services. The Phantom engine incorporates a fully variable afterburner system. Civil Speys are in airline operation both in Europe and North America and are to power the Fokker F.28 Fellowship, the Grumman Gulfstream II and Lear Liner Model 40 jet transport.



V/STOL Rolls-Royce has the greatest variety of V/STOL propulsion systems and experience in the world. These systems include lift jets, deflected thrust and thrust vectoring of propulsion engines by swivelling engines, swivelling pods and rotating cascades. Rolls-Royce is co-operating with Europe and the United States in the development of military V/STOL engines.

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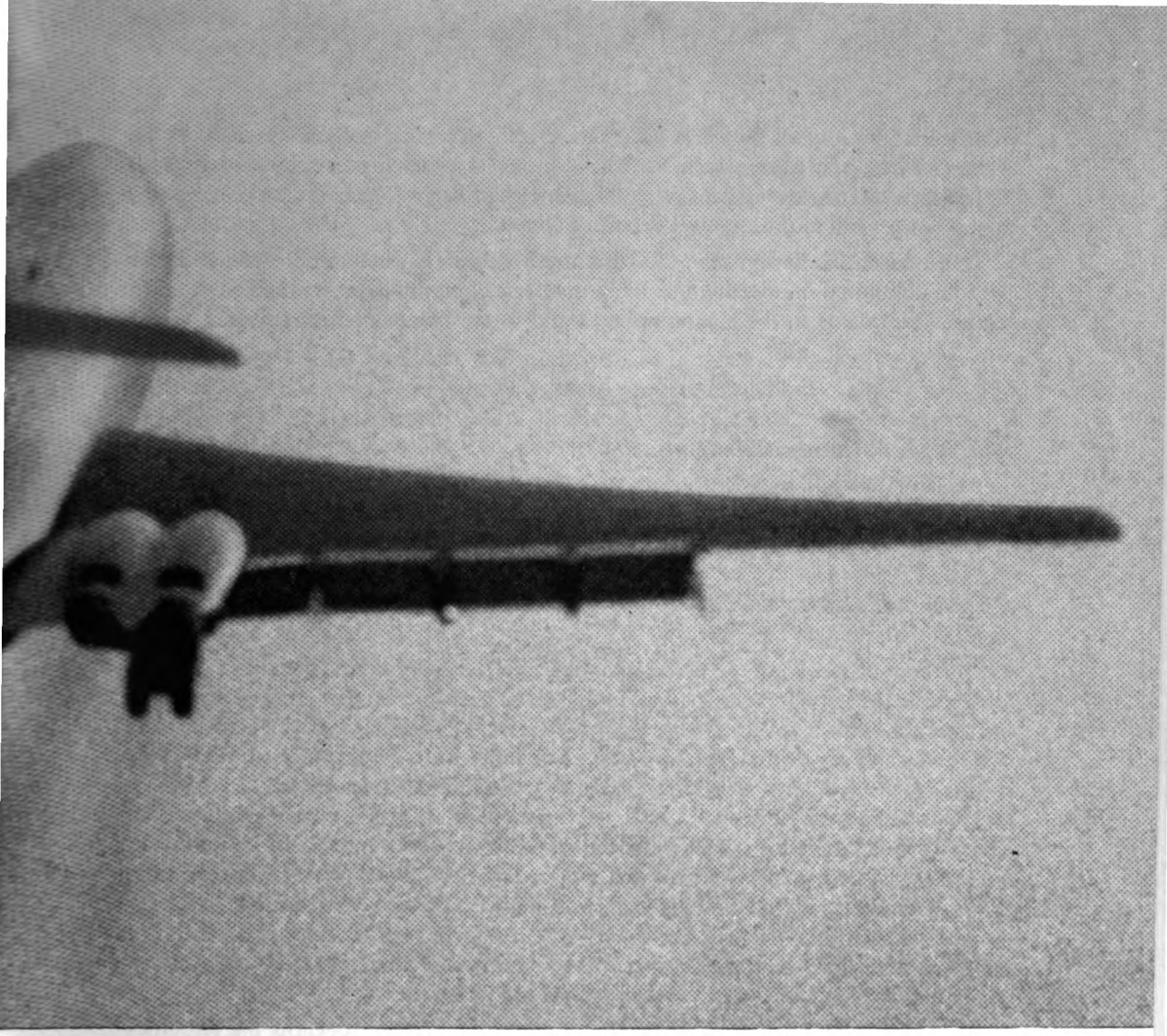
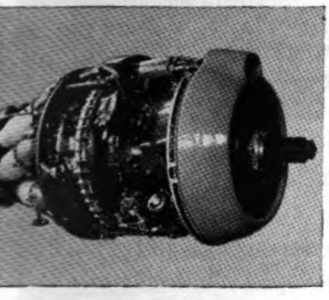
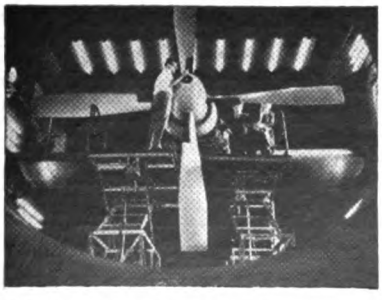




RT PROPJET Variants of the propjet are in world-wide opera-n, or on order for, 12 types of civil military aircraft. In commercial ation the Dart has accumulated than 35 million hours of experi- and the time between major over- has now reached 6,000 hours.



TYNE PROPJET The Tyne is the most powerful civil propjet in service in the Western World. It also has the highest power-to-weight ratio of any propjet in the West. A consortium of European manufacturers is producing the Tyne, for the military Breguet Atlantic and Transall C-160 aircraft.

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above all, the human factor is very much with us. We are faced, in fact, by an ever-widening spectrum which for Britain entails agonising decisions of balance between what military power is politically desirable, what is militarily necessary and what we can afford on a set defence budget.

It is against this background that this article considers whether our defence forces will be able to go on meeting our likely strategic commitments, or whether we must make adjustments to these commitments and to the balance of our forces.

THE PRESENT SCENE

The Shape of Current Commitments

Clearly, the key factor in this kind of assessment is to identify our likely commitments as accurately as possible, for this is the only way to avoid wasteful effort and so to produce the best possible balance of forces. However, what happens in the reasonably near future can only be a development from the present and it is therefore relevant to look briefly at some of the main facts which determine the current situation.

Our commitments are at present shaped by four main considerations. The first of these is the need for our own national security and it requires no spelling out on its own account. It is very closely tied to the second consideration, which is our need for allies; and the two are thrown into clear relief by the Communist threat. This threat is world-wide in scope and dynamic in nature. It covers a vast spectrum of action which ranges from subversion, through guerilla operations and limited wars, right up to the risk of general nuclear war. It therefore poses an enormous and extremely expensive problem for the countries of the Free World, who can only hope to combat it by banding together. But this allied approach to national security, however inescapable it may be, does engender some intractable problems, for it involves alliance commitments which are binding and long-term, and this makes it difficult for us to change or modify our individual policy.

The third consideration which bears on our commitments concerns the liabilities which still remain from our being a world-wide colonial power. Many of these liabilities have far-reaching ramifications and we should be irresponsible in the extreme if we tried to avoid them. The independence of Cyprus and Malaysia are cases in point. Here we have had to act carefully and responsibly in the long-term interests of world peace; and as long as we have ties of this nature, we are likely to be called on for military as well as political and economic support.

The fourth and final consideration is our stake in world peace and stability. We live by trade, we need oil and other key commodities in order to make our national way. It therefore behoves us, and nations like us, to help the less developed countries because this is part of the cycle of stability. Put simply, it is a case of helping ourselves by helping others. But it does mean involvement in world affairs in their widest possible sense and therefore it could implicate us militarily in peace-keeping commitments, either under the UN or with allies.

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It is clear, then, even from this brief survey that our current strategic commitments are considerable and that they are based on some pretty hard and realistic facts of life. Before considering how they may change, it is valuable to look at our present broad concept for meeting them because, if we do this, we are more likely to see the whole balance of future commitments and forces in true perspective.

The Broad Military Concept

Deriving from what has been said above about our commitments, our present defence policy has two main purposes; 'to guarantee the nation's security and to contribute towards peace and stability in the world as a whole'.* To this end our broad military concept is moulded round the three major alliances, NATO, CENTO and SEATO; and our general disposition of forces fits accordingly. We have a nuclear strike capability which we intend to use primarily in an allied context. We have forces deployed in Europe which conform to SACEUR's current doctrine there. We have other forces based mostly on a unified command system in the Near East, the Middle East and the Far East, and the possible operations they may have to carry out have been considered in close co-operation with our allies in those areas. In Britain itself we have a strategic reserve and the necessary air transport force with which to deploy it overseas at short notice; and we also have certain forces and preparations for the purely domestic defence and survival of our homeland.

This military concept has been put to the test several times over recent years and our forces have been active in Kuwait, Cyprus, Aden, East Africa and Malaysia. Their performance has evoked interesting reaction. Many critics have been so busy bewailing in their own faint hearts the terrible things which might have happened that they have seldom given our forces credit for what they have achieved; and a great deal has been achieved, as witness the present campaign in Malaysia. It is true that we have been at stretch and have had to switch our forces sometimes rapidly between one trouble spot and another but this does not mean that we have been found wanting. Indeed, the fact that we have been moving towards greater flexibility in our operational deployment is right. It shows that we understand what is involved by the threat.

So, the sum of the current situation is that we have heavy commitments and just about adequate defence forces. However, if now defence costs rise but expenditure is pegged for economic reasons, we may be heading towards very considerable difficulty and it is therefore to the likely trends of the future that we must now turn.

THE LIKELY FUTURE

The Possible Commitments

Given that our future commitments are more likely to be variations of those outlined above rather than radically new ones, it is sensible to consider primarily the shape of the threat from the Communist nations.

* Statement on the Defence Estimates, 1965

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As regards Russia, there are strong indications that the dangers of nuclear war have modified the old Communist tenet of physical world domination. Nowadays it is becoming more generally accepted that, instead, Russia's aim is to lead the progressive spread of Communism world-wide. It is probable, therefore, that Russia will want to continue a policy based on peaceful coexistence. The Soviet leaders must have calculated that this is just about the only policy which gives them a chance of matching or outstripping the United States, which in their eyes is the epitome of Western strength. They have seen how this policy enables them to consolidate Russia's national position, how it promotes the growth of economic and technological strength and, in turn, how the outward and visible signs of such strength bring political influence with the developing nations. In comparison, direct pressures like those applied in Berlin and Cuba pay little practical dividend and are not therefore likely to be widely employed. This is not to say that the Soviets regard themselves as home and dry, or that their future actions will lack the dynamic qualities of old. There is much building to be continued at home and much fertile ground to be exploited abroad. In the latter context, unstable areas such as the Middle East, Latin America and Africa are profitable for the spread of Communism and the undermining of Free World influence; and there seems little doubt that here and wherever else possible Russia will prod away at infiltration, subversion and conflict short of major war. For us in Britain this can only mean that where we have commitments on the world scene, either alone or with allies, we can still expect to be involved with Soviet-inspired outbreaks of trouble. Moreover, because this kind of policy now offers the best prospects of what Russia regards as progress, these outbreaks are likely to increase rather than otherwise.

As regards China, the problem is altogether more complex for it reaches far beyond the realms of strategy. China is at one of those periodic peaks in her long history where strong government is producing an aggressive national outlook. She is smouldering under exclusion from the forums of the world, she is flexing the muscles of encouraging internal development and she sees no reason why, like Russia, she should water down the basic precepts of Communism. In this kind of mood she tends to eschew the dangers of nuclear war and to lean overconfidently on the prospect of possessing nuclear weapons in her own right. She is, in fact, a cold-shouldered nation making good and therefore her prestige in the eyes of the developing nations is becoming very high indeed. Herein lies her greatest danger to the Free World and some of her inroads of influence into the Middle East and Africa ought to be a serious warning of what may lie ahead. It warrants stressing again that the solution to the Chinese problem is not to be found in military containment alone. It is a world problem in the very broadest sense of the term and nothing short of international patience and forbearance over a protracted period is likely to settle it. Meanwhile, for the immediate future it would be most unwise to underrate China's ability and willingness to make trouble for the West. Certainly she is not going to run herself headlong into a world war but all the signs are that she will be prepared to take considerable risks in reasserting herself as a major power. We can therefore expect increasing trouble on China's own doorstep. India has already

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had a nasty taste of what this can mean and other countries can expect similar pressures whenever China judges that the time is right. Further afield, in the Middle East and Africa, the political and economic influences which China has exerted to date may well take on a more militant look. We in Britain shall find it hard to escape the ramifications of these policies and pressures. Our alliances will automatically involve us in counter-actions, particularly in view of the intense antipathy which our major ally, America, feels towards China's entrenched communism; some of our Commonwealth connections will also involve us and so will our stake in world peace and stability.

The whole prospect for the future, then, seems to suggest increasing commitment in those lesser forms of military action which have characterised the past twenty years. This commitment stems from major world forces which are beyond our purely national control. Thus, the only sensible course of action open to us is to produce the best possible balance of political, economic and military resources we can in support of Free World action; and on the military side there are certain salient factors which will govern what we can or cannot do.

Our Future Resources

The setting of this essay assumes a pegging of defence expenditure at around 7% of the GNP (in reality it may be less) and in a climate of rising costs and increasing weapons complexity, this is obviously a very serious factor in limiting our future military resources. But it is by no means the only limitation, for manpower is also at a premium and we cannot expect very much above the present figure of some 425,000 all-regular forces. Again, the same kind of consideration applies to the proportion of scientific and industrial effort which can be spared for defence purposes. There is no point in merely carping, as so many critics do, about these allotments of money, men and resources. In round figures and in comparison with our allies, they represent a very fair share of our total national effort and we must always ensure that they are kept at this sort of reasonable level. We should be irresponsible, even foolish, if we resorted to drastic increases and then broke our own back in the process.

There is a further handicap. Mainly because of the four considerations, outlined earlier, which dictate our commitments, both the present Government and its predecessor have rightly resisted pressures to depart from the broad concept of a world-wide strategy. And for easy application such a strategy requires facilities overseas in the form of garrison centres, base areas, staging posts and stockpiles. All the latter are becoming progressively difficult to retain and so it follows that military deployment is also increasing in difficulty. Yet paradoxically, flexibility in deployment is the keystone to operations on a global scale.

We therefore find ourselves going round an awkward circle of strategic complexity. We have argued above that at present we have considerable commitments based on hard facts of life and that our resources are only just about adequate to meet them. Yet in future we face the prospect of having to match increasing commit-

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ments with, if anything, a shrinking capability. This is obviously a situation in which, if possible, commitments must be adjusted and resources reorganised to produce reasonable compatibility.

THE BASIS OF BALANCE

In seeking better balance for the future it is important to remember two basic facts. One is that our strategic commitments are determined by our foreign policy. In themselves, therefore, they tend to change by gradual evolution and not through a series of radical upheavals; this is borne out by the steadiness of our attitude towards Anglo-American relations, towards colonial emancipation and towards our alliances. Nonetheless, commitments nowadays cannot escape powerful influences. Rapid communications, speedy deployment capability and the enormous ranges of certain weapons shrink strategic areas to almost puny size. At the same time the media for mass propaganda and the impatience of nationalism can give very swift and powerful impetus to events in a given local area. Consequently, though commitments themselves may change but slowly, the emphasis of importance between them can switch almost overnight. It follows, therefore, that our forces must be extremely flexible.

The second fact is that strategy does not stand still. Very many influences work on it too, so that what may appear insupportable today may look quite different in say, ten years time. Our ability to operate a world-wide strategy since 1945 despite the loss of many overseas facilities is a good example on this score; and in the future the possibility of a widening split between Russia and China may bring us relief which is not apparent at present.

It is appropriate here to recall the four basic elements which currently shape our commitments. They are our need for national security, our need for allies, our remaining colonial responsibilities and our stake in world stability; and we have seen that the major influences of the foreseeable future do not materially change them. If we now do the almost mathematical sum of adding these elements to the two basic facts stated above, one thing becomes fairly clear. It is that we shall best achieve adjustments by paring and pruning in detail, rather than by attempting wholesale abrogations.

One fairly obvious and reasonable possibility lies within our alliances. Many of our allies have grown in strength both economically and militarily over recent years and ought therefore to take an increasing share of the overall allied burden. Germany in NATO is a case where this is being done. Similarly in CENTO Iran though by no means self-sufficient or strong enough as yet, ought over the coming years to be showing some dividends for the considerable aid she has received in the past. In the Far East, Australia is now building up a powerful reaction to the threat there, after a period of tending perhaps to expect too much from ourselves. We must press vigorously for this kind of development in interdependence. We have not pressed hard enough in the past, mainly because as the former head of a great empire we do not find it easy to pass on our burdens to others. This is not to infer that we should do less than our share. But we do more than our share at the moment judging from some of our figures for overseas expenditure.

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Similarly we must seek savings within the Commonwealth. Admittedly, situations like that in Malaysia will continue to give us trouble but we must insist with our Commonwealth partners that there is a proper sense of balance about what we can do and how long we should continue to do it. In the long run, our own national security in the European and North Atlantic sense is just as important to the Commonwealth nations as it is to ourselves, because as we have seen, the threat from Communism is world-wide and not confined to any particular region.

Regarding our stake in world stability and our need to trade we must never forget that we live in an age where the independence of nations, even the smallest ones, is the sensitive factor. In the long run, again, we shall best preserve our own interests by fostering international understanding and mutual trust, rather than by attempting to apply pressures. Our oil supplies, for example, will best be safeguarded by political settlements in the Arabian Peninsula and not by the everlasting presence of military forces.

Admittedly, policies like these can only be applied gradually and will take time to mature. They will not wipe away our present burdens. They will not enable us to side-step the future pressures from the Communist nations, for there are few short cuts in what Mao Tse-tung calls 'the protracted conflict'. Nonetheless, if we work firmly and methodically for increased interdependence and better international relations, and seek out even the most marginal of savings, we shall eventually achieve a cumulative reduction in commitments.

If this diagnosis is reasonable, adjustments in our balance of forces will follow, though they also will take time. For the present there is very little wrong with our basic concept of using the twin principles of mobility and flexibility to operate a home base and a unified command system overseas; and our balance of naval, land and air forces has proved reasonable. We must, however, look ahead to the time when our numbers of major fighting components (ships, aircraft and tanks) will be reduced because of cost and when we may have very restricted base facilities overseas. In this situation we shall almost certainly have to modify very radically our traditional concept of a long strategic axis stretching from Britain to the Far East. Instead we shall have to accept complete viability at both ends of the axis only; that is, the UK base and probably some form of major Commonwealth base area in Australia. The strategic disadvantages speak for themselves but we shall be unwise if we close our eyes to the trends which are already evident today. In the event, new factors may come to our support. India, for example, under pressure from China might give us increased facilities for stockpiling and staging. And if our political efforts towards interdependence in CENTO and SEATO bear fruit, we can reasonably expect increased support also from our allies in those areas, particularly in the form of manpower on the ground.

It looks therefore as though we shall have progressively to build our primary nucleus of strength in Britain (and NATO Europe), to develop a reliable base arrangement in Australia and to go on improving our capability for very rapid long-range deployment. The problems are, of course, enormous and where balance

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of forces are concerned, it is easy to fall for certain current theories that an afloat strategy will provide all the answers. In fact, this is far from true. Naval power, for all its undoubted importance and very considerable assets, is by itself too slow to cope with the speed at which modern commitments move and change in emphasis. We ought to look very seriously, therefore, at the priority we envisage for our future capability in the air, because there is a growing national contention that air power is an expensive luxury which we cannot afford. But if we neglect air power and fail to maintain balance among the various components which are the essence of its strength and effectiveness, there can be little real hope of meeting even our primary need, national security.

CONCLUSION

From the foregoing it is clear that we face some very formidable strategic problems. To date by making the maximum use of flexibility and mobility, our forces are just managing to cover a wide range of commitments which are based on hard facts of life. From the nature of the threat in the future it seems likely that we shall need an increased quick-reaction capability; yet both our forces and our overseas facilities face the prospect of significant reduction. Basically this is an enigma to which from Britain's viewpoint there is only one answer. It is to seek a better balance of inter-dependence with our allies than exists at present. At the same time we must anticipate the future problems of deployment which will arise if, as seems likely, there are radical changes in our present strategic axis between Britain and the Far East. In such circumstances the effectiveness of our military reaction will depend almost entirely on speed of movement. We shall not achieve this speed of movement by naval forces alone, no matter how popular such a concept may currently be. In fact, time will probably prove that only air power, air power in true balance, can give us the edge we need on our future military capability. If we neglect this fact, we do so at our peril.

Editor's Note

This article was awarded the First Prize in the Gordon Shephard Memorial Prize Essay Competition, 1965

THE GORDON-SHEPHARD MEMORIAL ESSAY PRIZE COMPETITION 1966

1. The subject for the 1966 Gordon-Shephard Prize Essay Competition which is open to all serving members of the Royal Air Force is:

> "Assume that the British Government will provide funds for the exploitation of space for one military and one civil project. Discuss space project priorities so far as Britain is concerned."

2. The prizes for the 1966 competition are first £50, second £25 and third £10. The closing date for the competition is 1st May, 1966. Full details of the regulations are given in DCI(RAF) T547/1965.

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ROYAL MALAYSIAN AIR FORCE

By Air Commodore A. McK. S. Steedman, C.B.E., D.F.C., R.A.F.
(Chief of Air Staff, Royal Malaysian Air Force)

FORMATION

On the 17th April, 1958, a Scottish Aviation Twin Pioneer flew the last stage of its journey from the United Kingdom to Kuala Lumpur. At the controls from Betterworth was Air Commodore (now Air Vice-Marshal) A. V. R. Johnstone, D.F.C., the first Head of the Air Force in Malaya. The aircraft was welcomed at Kuala Lumpur by the Minister of Defence, Dato (now Tun) Haji Abdul Razak bin Hussain and a number of other dignitaries. Later in the month the aircraft was named "Raja Wali" by the Prime Minister, Tunku Abdul Rahman Putra Al-Haj. This was the first tangible sign of the birth of the Royal Malaysian Air Force and, at the end of that month the record shows that the strength of the Force was:—

Officers	—	3
NCOs	—	3
Airmen	—	Nil
Aircraft	—	1

For the previous 20 months, Air Vice-Marshal Johnstone had been working behind the scenes, initially as Air Adviser to Tunku Abdul Rahman and subsequently as Air Officer Commanding the R.M.A.F., making all the preparations necessary to bring the Air Force to life. Unlike the Army which was very well established with over 10,000 men under arms, and the Navy which had a compact flotilla of small ships already operating, there was no embryo Air Force on which to build, there were no aircraft and no airfields. In 1947 the Royal Air Force Regiment (Malaya) had been formed by the British Government, enlisting Malays to help in the emergency operations against Communist terrorists. In 1950, a new organisation, Royal Air Force (Malaya), was formed and all indigenous races were enlisted to be trained as tradesmen, for employment on Royal Air Force airfields in the Malayan peninsula and in Singapore. This organisation continues to operate with the R.A.F. in Singapore today. There was also the Malayan Auxiliary Air Force, formed before the war and resuscitated in 1947, which provided a reserve for emergency. Some of the more experienced R.M.A.F. officers and SNCO's have transferred from these forces. The reserve today is called the Royal Malaysian Air Force Volunteer Reserve and comprises an Airfield Defence Squadron and a limited number of pilots who undergo flying training with Flying Clubs. The Airfield Defence Squadron has been embodied in the regular force for the duration of Indonesian confrontation. The pilots provide a source of recruiting for the regular force, a war reserve and a useful

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contact with the business world and the other professions in a country which is not yet air minded.

The Federation of Malaya became an independent nation on the 31st August, 1957—Merdeka Day—and the Royal Malayan Air Force was formed officially on the 1st June, 1958. The policy for the employment of the Air Force, recommended by its first Head, stemmed from the geography of Malaya and the democratic nature of its Government. The tasks of the Air Force, which became the Royal Malaysian Air Force on the formation of Malaysia on 16th September, 1963, can still be summarised as the provision of air support for the ground security forces—which, in Malaysia, include the Police as well as the Army.

Air Vice-Marshal Johnstone has recorded that his main considerations in constructing the Air Force were that the aircraft should be multi-purpose but as simple as possible and capable of assisting the prosecution of the emergency by operating from jungle strips. He was hindered in his recommendations by financial stringencies which initially barred the acquisition of helicopters and so dictated the purchase of STOL aircraft, namely the Scottish Aviation Pioneer and the Twin Engined Pioneer. He envisaged that these aircraft could usefully be employed in the following roles:—

(a) Short Range Transport.
(b) Troop carrier.
(c) VIP Transport.
(d) Air Ambulance duties.
(e) Voice aircraft.
(f) Light bomber.
(g) Coastal patrolling.
(h) Photography and Reconnaissance.

They have been employed in all these roles plus leaflet dropping but excluding bombing, and continue to be so employed now.

Growth

The nucleus of the Royal Malayan Air Force formed alongside the Royal Air Force on the airfield at Kuala Lumpur. As has happened with so many Commonwealth Air Forces, the R.A.F. nurtured the growing Service and provided support in countless ways during the early days. Nearly eight years after the birth of the R.M.A.F., the R.A.F. is helping still, not least by lending experienced officers and senior non-commissioned officers to teach, guide and demonstrate. The two Services now work side by side throughout Malaysia, sharing operational tasks and running what amounts to a joint transport service, each side accepting passengers sponsored by the other. In recent years the Royal Australian Air Force and the Royal New Zealand Air Force have joined the R.A.F. in providing experienced officers to help the R.M.A.F., which is developing and expanding whilst concurrently meeting a heavy operational task.

There have been several notable milestones in the growth of the R.M.A.F. The first major event was the handing over of the R.A.F. Station at Kuala Lumpur to the

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A HERALD of the Royal Malaysian Air Force banking over the Merdeka Stadium in Kuala Lumpur

R.M.A.F. on 25th October, 1960. The airfield was then shared with the Ministry of Transport and Civil Aviation on a joint-user basis until the opening of Kuala Lumpur International Airport on 31st August, 1965. Despite the friendly relations which existed throughout with the Directorate of Civil Aviation, it was a great relief to the Air Force to become the sole user of the airfield. Even now overcrowding is serious and the expansion is continuing with the construction of new bases in East and West Malaysia.

The introduction of the Alouette III helicopter in August, 1963, enormously increased the scope of operations in the jungles of Malaya, Sarawak and Sabah, and the arrival of the first Herald in November, 1963, marked the entry of the Air Force into the medium range transport field. These aircraft had been planned to enter Service much later under the original expansion programme. However, the onset of Indonesian confrontation initiated a heavy load of operational work, which necessitated a very rapid acceleration of the expansion of all three Services. Advancing the formation of the Herald and Alouette squadrons involved increasing the capacity for technical training and the level of expatriate assistance in the Air Force.

Two major advances on the ground were the establishment of a School of Technical Training at Kinrara in August, 1963, and the opening of an Equipment Depot at Kuala Lumpur in January, 1964. Prior to August, 1963, apart from a

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small number of airmen sent to overseas training establishments such as Halton and Locking in England, technical training had been done on an ad hoc basis within the Technical Wing at R.M.A.F. Kuala Lumpur. Now all basic and advanced technical training in airframes, engines and electronics is carried out at the School of Technical Training and the output is some 320 airmen per year. Training at the School covers a wide range. Airmen in certain limited specialist trades have to be trained overseas —armourers, for example, go to Australia—but courses have been run for suppliers from the outset, recruit training is now an S of TT responsibility and plans are in hand to train clerks. Specialist supply officers' training is also periodically carried out.

The establishment of the Equipment Depot greatly eased supply problems. Previously the Base Supply Squadron at R.M.A.F. Kuala Lumpur and the small staff in the Air Staff Division of the Ministry of Defence used to share the work of a Depot between them. With seven types of aircraft and a 9000-mile pipeline, this was an unsatisfactory system both in principle and in practice but, like Topsy, "it just growed" and had to be accepted until the Depot was built. Now the Depot covers not only the normal receipt, control and issue of equipment and spares, but also the provisioning done in the R.A.F. by DGE's staff in MOD AIR. Unlike the R.A.F., a system of manufacturer's part-numbers is used rather than a self-contained single-service referencing system. Such is the length of the pipeline that it is necessary to rely on a commercial agency for procurement and the Crown Agents act for the R.M.A.F. worldwide. However, market research into local availability of equipment is becoming of increasing importance with the advance of industrialisation in Malaysia and a section has been formed for this purpose.

A Flying Training Squadron was established at R.M.A.F. Kuala Lumpur in December, 1958, using Chipmunk aircraft. These were replaced by Provost T.51 aircraft in November, 1961. In July, 1964, a Flying Training School was formed at the R.M.A.F.'s second Base at Alor Star, with two intakes of 15 students each per year. During the current rapid expansion this is quite inadequate to provide the numbers of pilots needed to man the new squadron, consequently much depends upon friendly countries overseas providing vacancies for pilot training in their Air Forces. This year Malaysians are being trained in the United Kingdom, Canada, New Zealand, India and the United States. In addition qualified fixed wing Malaysian pilots are being converted to helicopters in a civil school in France. By the end of the decade, however, the expansion will have slackened sufficiently to allow the output from Alor Star to supply the Air Force's needs. The standard of training is high and the wastage is comparable with that in long established Air Forces.

From the early months of its life, the Air Force has been continuously engaged in operations in the border security area on the Thai/Malaya frontier. The Police forts are still maintained by air supply and the members of the Police Field Force who man the forts are transported in and out by STOL aircraft or by helicopters. In December, 1963, a detachment of Twin Pioneer aircraft was established at

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ALOUETTE helicopter with floats landing on the deck of KD HANG TUA, a Royal Malaysian Navy frigate

Labuan off the west coast of Sabah, and it has worked alongside the R.A.F. detachments there ever since. In July, 1964, a detachment of Alouette III helicopters was moved to Tawau in eastern Sabah and this also remains there, working with the R.A.F. For operational convenience, R.M.A.F. aircraft in East Malaysia are placed under the operational control of the R.A.F. Commander, Air Forces Borneo (COMAIRBOR), who is responsible for air operations to the Director of Borneo Operations, who in turn reports direct to the Combined Operations Committee in Kuala Lumpur.

In operations in East and West Malaysia, Malaysian pilots have done very well. Starting with sound basic training their standard of pure flying has become remarkably high mainly because of the limit-flying necessary to operate from short jungle strips in rugged terrain. Many of these strips are one way—that is, landing can only be accomplished in one direction, with take off only towards the landing approach—and, in some cases, not only do the hills block the view of the strip either down wind or on the base leg, but the pilot is committed to land when at an altitude of several hundred feet and cannot overshoot. This is a wonderful training ground in which to get to know an aircraft and one quickly comes to appreciate the value of accuracy in flying. Almost all Malaysian pilots have been trained in this type of flying as the Twin Pioneer Squadron is not only an operational unit, but also provides the bulk of advanced flying training for pilots who gain their Wings either at Alor Star or overseas.

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Experience has shown that although Malaysians of all races tend to be slow in learning to fly, they amply repay persistence and extra tuition in training and they become thoroughly sound and very able pilots with experience. Few seem to have high natural ability to fly but, given the will to learn, they do very well indeed once they have learnt. The final product after a tour in a squadron compares favourably with pilots anywhere.

The aircraft equipment of the R.M.A.F. has progressed along logical lines. The Single and Twin Pioneer aircraft have done—and still do—a magnificent job. No other aircraft was capable of meeting R.M.A.F. requirements at the time they were bought. Now they are supplemented by Caribous. The Alouette III has proved to be a highly versatile and reliable helicopter and their number has recently been doubled. The communications and VIP Herons and Doves and the MRT/STOL Heralds are producing high utilisation and reliability in service. Today the six operational Squadrons of the Air Force form a highly effective transport support force. The R.M.A.F. has indeed come a very long way in a very short time.

The Future

The current very rapid expansion will continue for the rest of the decade. Construction is in hand of two new permanent bases which will open later this year. To enable the Air Force to provide tactical offensive support for Malaysian ground forces, squadrons of light strike aircraft are being formed. These aircraft will fill a serious gap in Malaysia's ability to defend her frontiers against aggression and to deal effectively with armed infiltration.

The Malaysian jungle is pervasive and highly restrictive to mobility on the ground. To be effective, ground security forces must be capable of rapid deployment in strength. Helicopters provide the only means of such deployment and the air provides the only means of subsequent supply. To meet these requirements larger helicopters are being procured for deployment in both East and West Malaysia.

Those of us who have been privileged to assist in the growth of the Royal Malaysian Air Force have watched it take its place alongside the other Commonwealth Air Forces with pride and satisfaction. Young in years but mature in performance, small in numbers but already rich in achievement, it stands squarely alongside the Malaysian Army and Royal Malaysian Navy in the defence of the Federation of Malaysia and of the democratic ideals for which Malaysia stands.

No. 58 SQUADRON, ROYAL AIR FORCE

The above mentioned Squadron will be celebrating its 50th Anniversary on Friday, 10th June, 1966.

A reunion of all aircrew will be held on that date at the Squadron's present Station, Wyton, Huntingdon. For details apply to the Squadron Adjutant.

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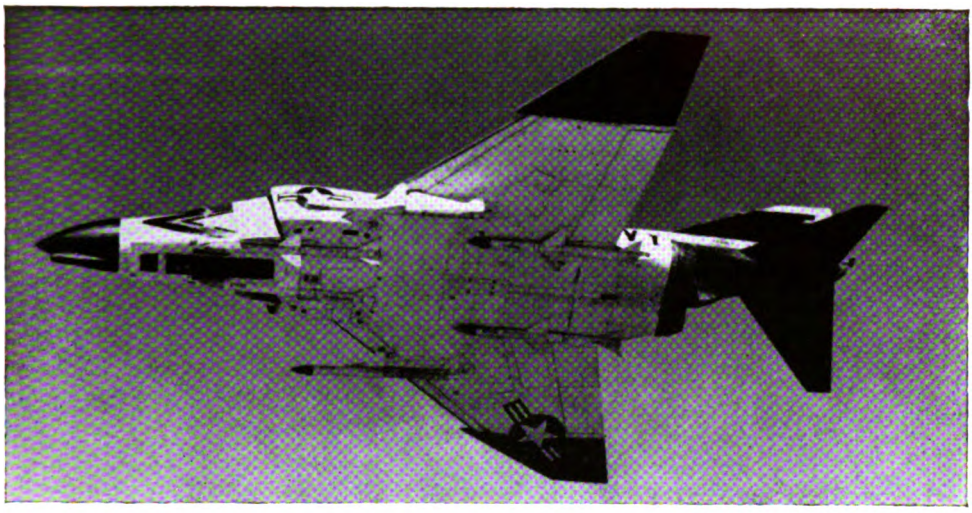

THE AMERICAN "PHANTOM"
With the cancellation of the British P1154, it looks as though the next best aircraft for the job will be a suitably developed air defence version of the "Phantom".

WINGS AND WEAPONS FOR WORLD POLICEMEN

By Wing Commander I. M. Pedder, o.b.e., d.f.c.

WHEN the Second World War ended I believed, in my naive way, that the Royal Air Force, the Army and the Royal Navy would soon join together with the armed forces of other world powers to form the basis of a peace-keeping force of a world authority. The birth of the United Nations Organization made this idea more credible; but within months it was clear that many nations were not prepared to abandon pre-war attitudes and were once more pursuing policies which would lead to intellectual and military conflicts. The world was not ready for a central authority to keep its house in order.

Twenty years later there exist a number of constabularies, of which the United States is incomparably the strongest and the United Kingdom the most experienced, but an effective and permanent world police force has yet to emerge. I believe it will

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emerge and am encouraged in this view by the efforts made by Canada, some Scandinavian countries and others to mould their services into efficient and acceptable world policemen capable of dealing with the lower scales of conflict in the world.

The role of a world policeman is to keep the peace, bring fighting to a halt quickly should it break out and arrest or contain aggressive forces no matter how strong they may be. This is a formidable task, involving actions varying from internal security to limited war, but one which has been successfully demonstrated in Malaya, Cyprus, Kuwait, Brunei and many other places. All three services have their part to play in these operations and the task of the air may include:

(a) Strike or deterrence.
(b) Air Defence.
(c) Strategic and tactical transport.
(d) Offensive support.
(e) Reconnaissance.

Let us look at the tasks of the air component in more detail and try to evaluate which aircraft will be best suited to the job and then let us consider the type of offensive support weapons appropriate to a world policeman of the 1970s.

THE TASKS OF THE AIR COMPONENT

Strike and Air Defence

The insurance for a favourable air situation is the maintenance of a credible and long-reaching strike force together with an effective air defence environment.

Since the employment of the strike element will mean that the conflict has reached limited war proportions its aircraft must be capable of penetrating modern air defences and accurately attacking discreetly selected targets. This is a task for an advanced, selective, long-range weapons system — a system which every nation or organization involved with peace keeping commitments must possess if its world position is not to be successfully challenged. At the beginning of 1966 the most prominent western contender for this strike role in the next decade appears to be the F 111.

The elements of air defence are many, but where there are intruders and an indeterminate state of conflict surface-to-air missiles and guns rarely have a part to play since the unknown "blip" must be intercepted and identified before positive action may be taken. The interceptor and, if necessary, destroyer must be a high performance aircraft with a comprehensive radar and weapons fit. It should have a substantial ferry range to allow it to move to forward areas and a good endurance to enable it to fly useful combat air patrols. Ideally it should be able to operate from rudimentary forward air strips but with the cancellation of the British P 1154 the opportunity of achieving this in the near future has been lost. For the next ten years it looks as though the best aircraft for the job will be a suitably developed air defence version of the Phantom.

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C-141 — The Strategic Transport

Transport

Strategic transport aircraft seem to be frequently available to the military in some profusion since civil aviation competition excites demand for this type. However when the aircraft is required to carry heavy vehicles and equipment in addition to troops the necessary modifications often prove expensive and difficult if not impossible, and few conversions have proved outstandingly successful. Although not truly a strategic transport in terms of range, the C 141 is probably the most efficient and versatile example flying today. In the later 1970s the Lockheed C-5A with its capacity of 365 fully equipped troops will probably best meet the requirements of nations seeking a high degree of strategic mobility. The USAF already has 58 of these aircraft on order and is considering doubling the force.

Both medium and light fixed wing tactical transports are required to move the larger units of men and the bulkier equipment within the operational area with a degree of economy. Although unable to meet the demands of very rudimentary airstrips, the later versions of the C-130 are probably best suited to meet the overall medium transport requirements, whilst the Caribou is an excellent example of a successful light transport.

In the field of V/STOL transports the helicopter still holds sway. Current turbine-powered Wessex and Whirlwinds are reliable developments of an old type which probably have some years of useful life ahead of them. But an optimum transport helicopter should probably be larger and developed versions of the "Chinook" may provide an acceptable solution for the 1970s. Some specialised heavy lift—"crane"—helicopters are also desirable for special tasks such as bridge building, moving heavy loads from ship-to-shore, and the recovery of damaged aircraft and vehicles. No doubt roubles are difficult to come by, but the Russian "Hook" appears to be an excellent crane!.

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The later versions of the C-130 are probably best suited to meet the overall medium transport requirements.

Offensive Support and Reconnaissance

It is probable that the offensive support and tactical reconnaissance tasks could be undertaken by one aircraft type which is able to meet the more stringent demands of limited war should the conflict grow to these proportions. Informed opinion sees the requirements met by a two-seat, twin-engined aircraft, capable of high speed, low level weapon delivery to ensure penetration, survival and effectiveness in the face of opposition by modern weapons. The aircraft should also have good endurance—so that combat air patrols over the ground forces may be flown—and a ferry range of about 3,000 miles. As with the air defence aircraft a STOL capability could liberate offensive support aircraft from developed airfields and allow them to disperse as a counter to guerrilla ground attacks. STOL ground attack aircraft could also operate from support carriers or assault ships.

One aircraft capable of meeting all these requirements and having a STOL performance does not seem possible in the next decade. The inevitable compromise must again be sought. The attack version of the Phantom comes nearest to meeting all the requirements except that of STOL. It is additionally attractive because its selection would mean that one basic aircraft type is employed in the air defence, offensive support and reconnaissance roles, thus easing maintenance, supply and training tasks. However the option to operate ground attack aircraft from small airstrips or ships should be available in order that minor, isolated incidents may be countered providing a favourable air situation exists. A STOL ground attack aircraft of high performance exists in the form of the P1127/RAF, and this could undoubtedly be developed into a useful and economic weapon system.

Maritime surveillance in peace keeping operations does not call for any new tricks by the maritime reconnaissance aircraft: it is merely another form of their primary role. The recently announced Comet-based maritime aircraft is an example of an effective modern solution to the problem.

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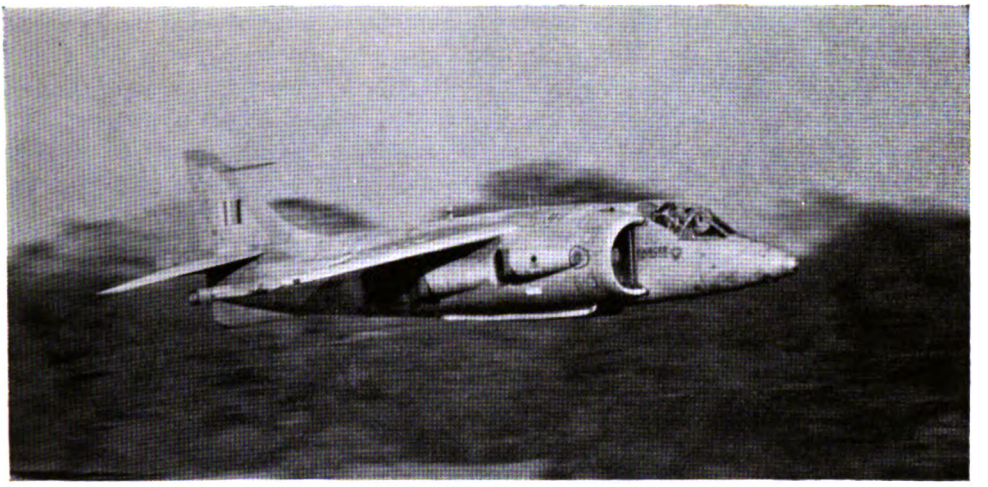

P.1127/RAF — The STOL Offensive Support Aircraft

Summary

Consideration of aircraft types appropriate to peace-keeping operations and able to make effective contributions should the conflict widen to limited war leads to a choice of the following:

(a) A strike aircraft. (F 111 or alternative)
(b) An air defence, offensive support and reconnaissance aircraft. (Phantom)
(c) A STOL ground attack aircraft. (P 1127/RAF)
(d) A strategic transport. (C-141/C-5A)
(e) A medium tactical transport. (C-130)
(f) A light tactical transport. (Caribou)
(g) A medium helicopter. (Chinook)
(h) A crane helicopter.
(j) A maritime reconnaissance aircraft. (Comet)

In studying the choice of aircraft one is conscious that the hardware is predominantly of United States design and manufacture. This is a fast-emerging fact of life—the western monopoly of new military aircraft capable of world-wide deployment away from main bases is in the hands of the United States. Any country or organization with peace-keeping commitments is therefore largely dependent on her for the supply or loan of aircraft. One wonders if this is a healthy or satisfactory state of affairs.

WEAPONS FOR OFFENSIVE SUPPORT

When the air component of the peace-keeping force is operating in the transport or reconnaissance roles it is hurting nobody. If it is called upon to carry out its air defence or strike functions it will usually be required to operate against military

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formations or targets and will be prepared to employ a range of weapons developed for limited or general war. But in the lower scales of disorder—rioting to guerrilla warfare—there will be occasions when the ground component may require support from the air and the question of weapon selection arises. It must be assumed that an overriding political guideline of any peace-keeping authority will be to keep casualties, particularly amongst the civilian population, and loss of property to a minimum. Is offensive support possible under such conditions?

The offensive support aircraft of 1966 is able to unleash tremendous firepower in terms of shells, guided weapons, rockets and bombs. The accuracy with which these weapons can be delivered is extremely variable and depends upon weather, terrain, attack profile and the state of the crew's liver. Generally speaking forward firing weapons, guns and rockets, prove to be the most accurate, especially when released in a dive, and the majority of the shot or shells could be expected to arrive within 100 feet of the target. All these weapons are guaranteed to kill or maim—but is this what is required? Do police employ flame-throwers and grenades when they are trying to bring a riot under control in Paris, San Francisco or Singapore?

The difficulties of target identification by offensive support aircraft are well known and there have been a number of tragic incidents in Vietnam where friendly aircraft have mistakenly attacked and destroyed their own villages and troop concentrations. Such results are totally unacceptable to any peace-keeping force.

The answer would therefore seem to be in the development of non-lethal weapons; weapons that could reduce the fighting efficiency of a guerrilla and reduce the heat of a riot situation. Such weapons exist now—in the form of gas. Tear, or temporarily incapacitating gas, is a feasible and acceptable weapon system in the hands of a policeman. It can be equally effective when released by a soldier or an airman, but its use by the military is unacceptable by many people; this is probably due to the emotion which the word "gas" excites. Other types of temporarily incapacitating agents might be found which would not arouse such opposition.

It is time that consideration was given to the development of non-lethal weapons and possible methods of their employment explored. All nations with peace-keeping responsibilities have an interest in this field, particularly those wishing to associate themselves increasingly with UN operations.

CONCLUSION

World policemen of the 1970s will require a considerable air component with a long-range capability if they are to intervene effectively in disputes and conflicts of all scales. They are likely to rely heavily upon the United States to supply the majority of their aircraft.

There is a requirement to develop non-lethal weapon systems if peace-keeping forces are not to be strong but impotent.

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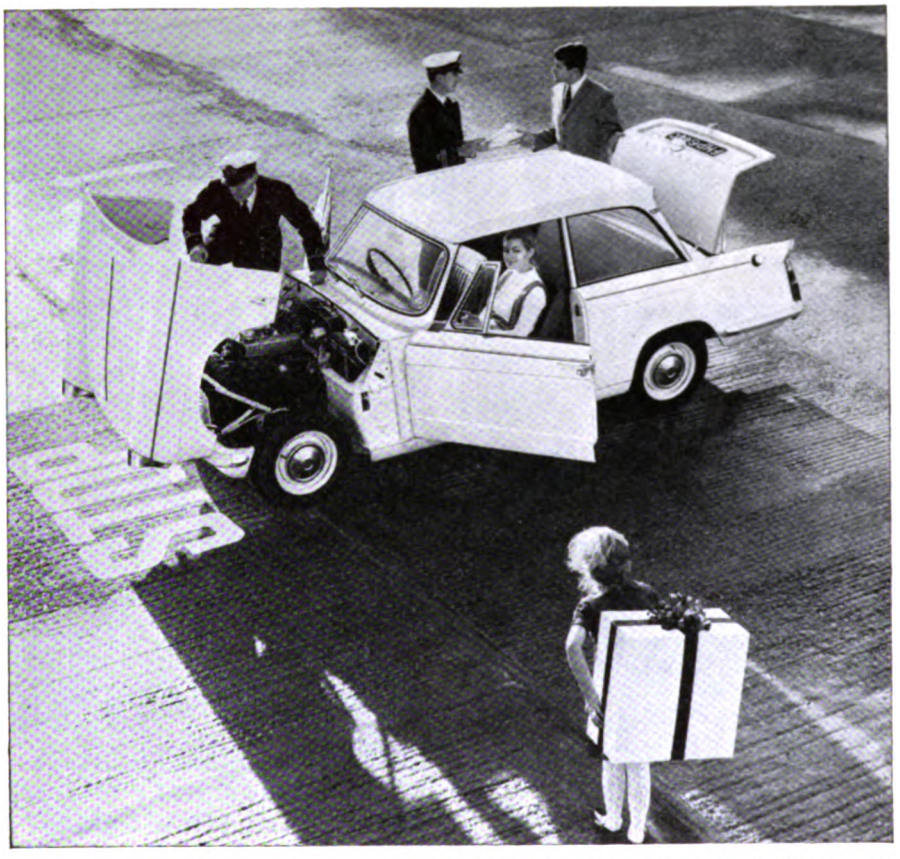

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OUT OF DUTY ACTIVITIES

By Squadron Leader P. J. Goodall, R.A.F.

IN the appointments columns of the national newspapers, amongst the situations offered for System Programmers, Internal Auditors, Research Chemists and such like, there appears the inevitable "Fly with the Royal Air Force". To some this may appear to be just another routine job. To others it will mean not only the thrill of flying a Lightning or the satisfaction of going round the world in a VC10, but the offer of a complete way of life with unique opportunities for travel, sport and even adventure, if the requirements of duty hours are considered to be too mundane! Many of these opportunities, which are available for everyone in the R.A.F. and are often taken for granted, are only enjoyed by very few in the civilian population. Certainly the mind boggles at the range of activities for the young Cadet today.

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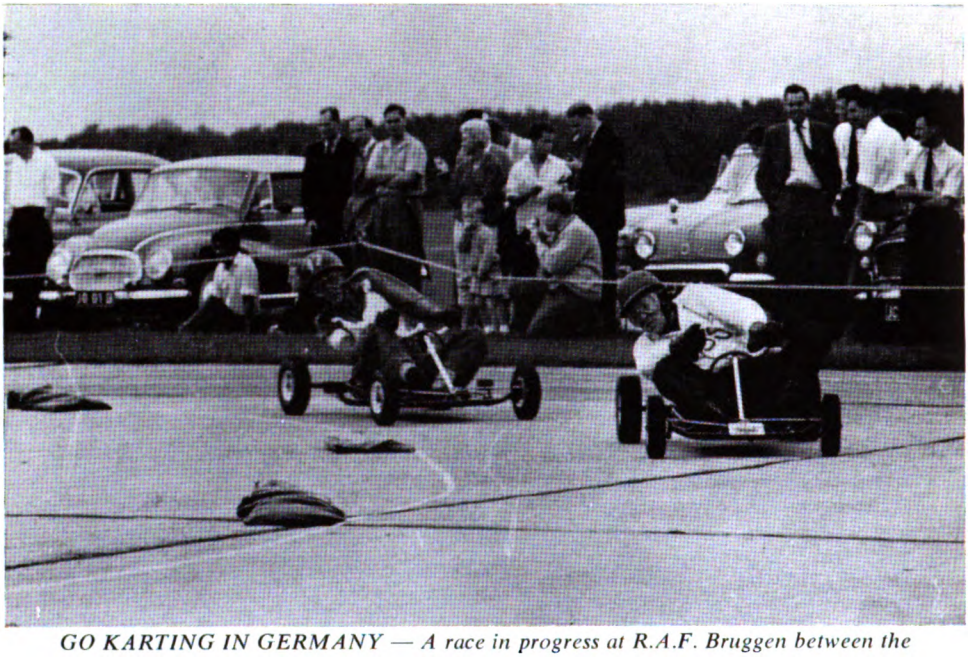
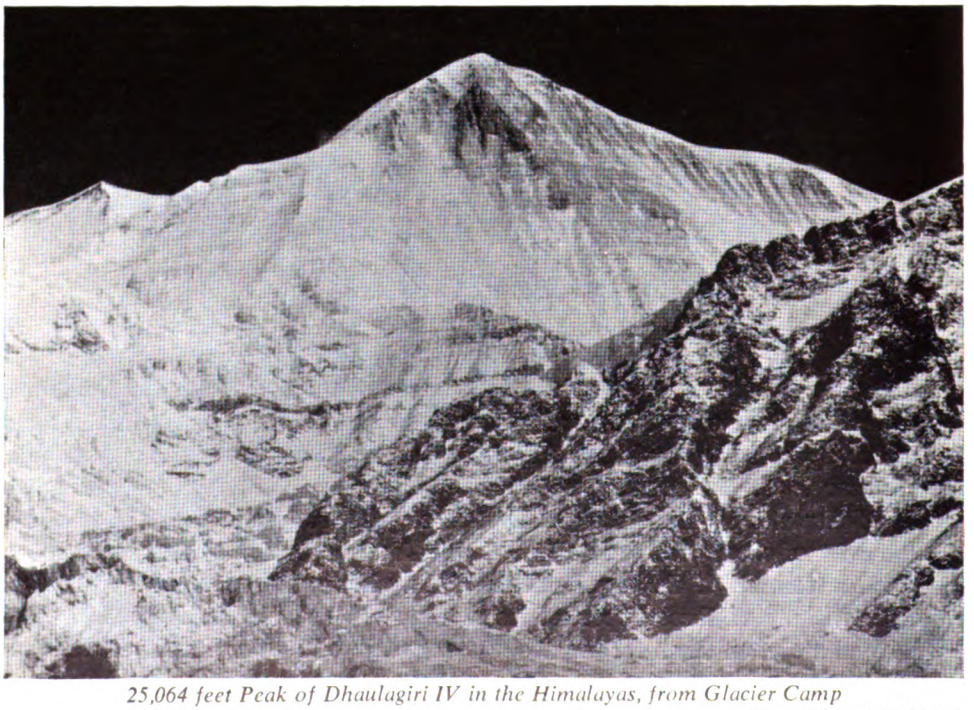


GO KARTING IN GERMANY — A race in progress at R.A.F. Bruggen between the ***R.A.F., Army and Dutch civilians***



25,064 feet Peak of Dhaulagiri IV in the Himalayas, from Glacier Camp

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During the summer of 1965 whilst the Universities, Cranwell and Henlow were on vacation, Cadets and young Officers visited almost every continent on every conceivable sort of activity. At Cranwell, apart from the routine summer projects of parachuting, ocean sailing, gliding, canoeing, fishing, pot holing and mountaineering, there were a number of special events which had financial assistance from the Trenchard Fund. This fund provides assistance for special projects and helped to finance such undertakings as mountaineering in Iceland, pot holing in Italy, Spain, France and Morocco, canoeing in Western Sweden, water skiing along the shores of Southern France, and, I think the most exciting of all, diving off the shores of the Scilly Isles for the wreck of the 74 gun frigate H.M.S. Colossus which sank in 1798. Three young Officers at University also received an allowance from the Trenchard Fund but probably had a little more excitement than they expected. Having bought a second hand car for £200 they set off for India; a round trip of some 13,300 miles through nine countries. After various misfortunes with mechanical breakdowns and a cholera epidemic in Iran, they eventually reached Afghanistan and pressed on for India crossing the border between Lahore and Amritsar, but by the time they reached Delhi, war had broken out between India and Pakistan. Realising that return by the same route would be impossible they left their car and by diverse means eventually indulged home by R.A.F. Transport Command. Activities of this kind continued through the Christmas vacation with Cadets climbing Mount Kilimanjaro in Kenya, camping and climbing in the Atlas Mountains, cycling from Perpignan on the Franco-Spanish border, to Rome, and participating in the normal winter sports pursuits culminating in the Inter-Service Colleges Ski Championship at St. Moritz.

Early in one's career in the R.A.F. there are generally few service or personal responsibilities, thus one is not prohibited from participating in many of these various undertakings. When training is completed, it is possible that an overseas posting might even widen the scope; one might be go-karting in Germany, playing ice hockey at Goose Bay in Canada or polo in Cyprus. But as the years pass the horizon will inevitably be narrowed with the shouldering of more and more responsibility and the natural concentration on fewer sports and activities. This is often the time when really high standards are achieved.

Possibly the most popular of all pursuits are the winter sports activities. This year the R.A.F. Ski and Winter Sports Association have made arrangements for about 1,000 R.A.F. men and their families to visit Zermatt. Intermingled with those on holiday will be the experts training for the Service, Inter Service, National and even International competitions. After the R.A.F. Championships at Zermatt the R.A.F. ski team will be making a determined effort at St. Moritz, to wrest the Inter Service Championship from the Army who seem to have monopolised it for some time. But if the R.A.F. results on skis may have been a little disappointing, the performances on toboggans and bob sleighs have been quite remarkable. The R.A.F. have won the Inter-Service Toboggan Championships five times since its inception in 1958 and this year will be defending the team, individual and speed championships. The team will again be captained by Squadron Leader C. N. C. Mitchell who in

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1959 was the first Briton to win the World Championship, and who this year will be hoping for an individual hat trick in the Commonwealth Games.

But possibly the most successful of all have been the R.A.F. bobsleigh team. It was only in 1960 that the R.A.F. resumed bobsleighing and since then the team have had both excitement and success. Last year when the team was competing in the American Championships at Lake Placid in New York State, the four man team was awarded an Indian Hatchet for breaking the distance record! From the start of this particular race the R.A.F. four were travelling very fast and after rounding the first long 40 yard corner, realised they would have difficulty in the next big corner "Zig-Zag" so they left the guide lines in order to get into "Zig" as early as possible. Fortunately this worked well and in clipping the lip on the exit from "Zag" they were nudged nicely into the straight and completed the course without further incident. Half way up the finishing straight the Captain, Flight Lieutenant J. Blockey, realised something was amiss as there appeared to be no braking, but shouts of "Brake" were to no avail. The bob became airborne over a road, up a hill just missing two boulders, airborne again over the brow before coming to rest in a wood. The Captain and No. 2 leapt off cursing loudly only to find the two other members unconscious on the back, the brake man having been knocked out by a chunk of ice when the bob hit the lip.

However this sort of excitement must be good for the team as the R.A.F. represented Britain in the 1963 World Four Man Championships at Igls in Austria, was selected as reserve for the 1964 Olympic Games and during 1965 represented Great Britain as the number two team in both the 2 and 4 man bobs; the 2 man team achieving 6th place in the first ever World Championship. This year the R.A.F. have new bob sleighs and the benefit of considerable scientific research which it is hoped will enable them to repeat their performance in the Inter-Service, National, European and World Championships.

This national representation is becoming a bit of a habit. If one was to mention that the R.A.F. had members in two national teams during the recent World Gliding Championships held at R.A.F. South Cerney, one might evoke the comment that this is expected of a flying service. But it was a technical officer who was in the British team and an equipment officer that captained Ireland, though one must admit that a pilot was selected as reserve for Great Britain.

Similar successes have also been achieved in another airborne activity, namely sports parachuting. In the 1964 British Championships, Sergeant Charlton won the individual title and R.A.F. Abingdon won the team award. In fact it was the R.A.F. Abingdon Club which formed the basis of the most recent official activity, the R.A.F. Sports Parachuting Association, which was only formed in November, 1965. The Association intends to expand its activities throughout the U.K., giving many members the opportunity for sports parachuting. Beginners make their first five jumps with static line operation before graduating on to free fall manually operated chutes.

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Of all these activities perhaps the most ambitious has been the R.A.F. Mountaineering Association's expedition to climb an unconquered peak in the Himalayas, the 25,064 feet Dhaulagiri IV. After two years of planning, the R.A.F. team left the U.K. in August, 1965, to fly to Kathmandu in Nepal. From their arrival in Nepal the team had the fullest co-operation from Government authorities and was in fact flown to Pokhara and on to Dhorpatan in Dakotas and Twin Pioneers of the Royal Flight. For the aviators it is worth noting that these aircraft were operating amid impenetrable obstructions up to 27,000 feet at their maximum all up weight giving a ceiling of about 15,000 feet and with no radio aids. From Dhorpatan the expedition employed local porters and marched to the Base Camp, arriving on time on the 13th September. The climb went well up to Camp III which was established on the West Wall at 20,400 feet on 14th October. From here the summit party was selected and set out for the unclimbed face leading to the peak. Unfortunately the post monsoon weather had not been typical and avalanche conditions prevailed. So much so that only two hours after leaving Camp III two members were caught in a minor avalanche. Since the remaining three miles of the face had similar snow conditions, the leader, Squadron Leader J. R. Sims, decided to abandon the climb to the peak and concentrate on other lower climbs and in fact two parties climbed the 21,200 feet Ghustung Himal. After continuing poor weather the team abandoned much equipment to reduce weight and eventually returned to Base Camp on 23rd October. Apart from the experience of the climb, the expedition tried out much new equipment and the Doctor treated many local people particularly those suffering from goitre and eye troubles. The expedition fed mainly on food prepared by a new method called Accelerated Freeze Dried, which was apparently so good that some members put on weight!

Whilst a special expedition to climb an unconquered summit captures the imagination, this must necessarily be the "peak" of a climbing career and it is easy to forget all the mundane work that has gone into gaining the required experience. The mountaineers in Bomber Command, for example, meet once a month, either in the Peak District of Derbyshire, or in Snowdonia, or possibly during the summer, away in the Isle of Skye. These weekends of climbing are devoted to training the inexperienced but are required by the experts to keep in trim for their major climbs of the year. Whilst it is only a few who are able to join an expedition to the Himalayas, many mountaineers have been with the Joint Services Meet spending three weeks in the Alps climbing approximately fifteen peaks in and around the Mont Blanc Massif, scaling such slopes as the west ridge of Les Courtes, as shown in the photograph, with a 3,000 feet vertical drop beneath them as they climb. However it must be admitted that there are a number of pilots who prefer the whine of an engine to the security of a rock face when there is a 3,000 feet vertical drop below. There's one very close to the keys of this typewriter!

Despite all these activities in the air and on the ground the sea is far from forgotten. The R.A.F. has a most active Sub-Aqua Association whose last major expedition was to the Aeolian Islands to film and salvage cargo from an Helleric merchant galley sunk in the 2nd century B.C. The Association now has ambitious

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plans for a visit to the Barrier Reef. Then, of course, there is the R.A.F. Sailing Association with its world wide sailing ranging from the snake infested seas off Borneo to the quarry pools near Reading. In fact the R.A.F.S.A. has active clubs in every theatre throughout the world, with the most diverse activities in the U.K. from racing Finns in various International Competitions to offshore racing in the grandest style.

These are but a few episodes in the day to day life of the Royal Air Force. There has been little mention of riding or motor racing or . . . or of the many less active pursuits such as photography with the unique opportunities afforded by helicopter flying over the jungles of Borneo or formation flying in Britain. Whether it is on the slopes of St. Moritz, the mountains of the Himalayas or amongst the wrecks in the Aeolian Islands, there are unique opportunities for "play", for gaining new and vital experiences. And the more unusual and more unlikely, the more it will be welcomed.

NEW YEAR HONOURS LIST

G.C.B. (Military)

Air Chief Marshal Sir Wallace Kyle.

K.C.B. (Military)

Acting Air Marshal Harold John Maguire.

C.B. (Military)

Air Vice-Marshals A. V. R. Johnstone, D. C. McKinley, P. T. Philpott, D. G. Smallwood, H. G. Leonard-Williams. Actg. Air Vice-Marshal, D. N. Kington-Blair-Oliphant. Air Cmdre. E. G. L. Millington.

G.B.E. (Military)

Air Chief Marshal Sir Alfred Earle.

K.B.E. (Military)

Air Vice-Marshal Thomas Ulric Curzon Shirley.

C.B.E. (Military)

Air Cmdres. W. O. Baird, E. James, M. H. Le Bas. Gp. Capts. N. H. Bennett, J. R. Forsythe, R. W. G. Freer, L. Kendrick, J. Miller, H. L. Roxburgh, C. S. Thomas.

O.B.E. (Military)

Wg. Cdrs. J. D. Ackerman, H. V. Bunting, T. G. Dobie, E. D. Green, W. A. S. Harrison.

Wg Cdrs. R. Henderson, J. E. Jacobs, W. S. Lloyd, S. H. Martin, A. Powell, W. J. Randall, S. M. Russell, C. A. Wade.

Actg. Wg Cdrs. G. Ellams, E. Pryor, V.R. (trg.), F. E. Wood, R.A.A.F., Sqn. Ldrs. R. I. Holburn, R.A.F. Regt., R. Marshall.

M.B.E. (Military)

Sqdn. Ldrs. J. G. Alderson, A. H. C. Back, D. J. Barnes, B. C. Swinton-Bland, K. P. Cater, H. D. Costain, D. L. Coveney, D. J. Cullen, J. R. Dolby, E. J. Downs.

Sqdn. Ldrs. W. A. P. Holmes, H. S. Horth, D. P. F. McCaig (Retd.), R. McD. MacDonald, J. J. McNair, R. H. Morley, T. M. Stafford, J. Stirrup, C. O. Thatcher, W. Warhaftig, J. F. Williams.

Sqdn. Ldr. J. D. Willson, Actg. Sqdn. Ldrs. D. W. Coombes, J. S. Robertson, V.R. (Trg.), W. H. Sheppard.

Flt. Lts. C. E. Deacon, B. E. Lamming, D. H. Offiler, I. Olliver, K. R. M. Remfry, C. J. Smith, G. N. Stevenson, G. W. Thorn, J. Watt, D. J. R. Willis, Flyg. Offr. G. A. Newton.

W.O.s J. J. Brown, T. Coon, R. Dillon, A. Doxey, E. R. Gibbons, R.A.F. Regt., J. Gould, N. H. Gray.

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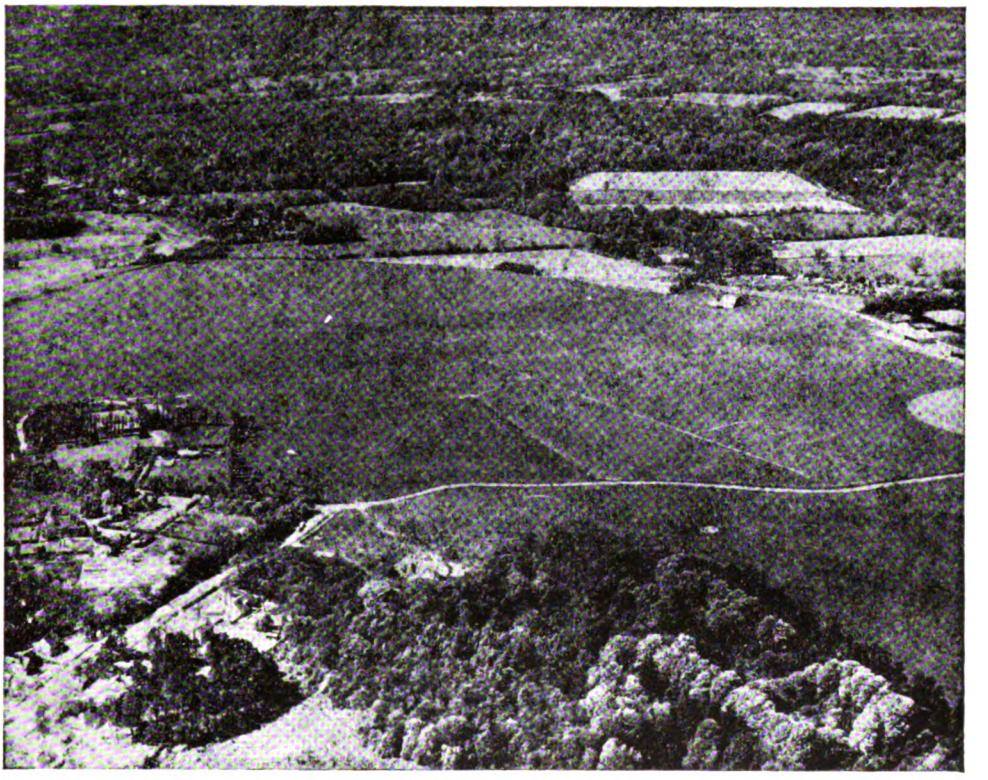
SPOT YOUR AIRFIELD 18



WHERE ARE YOU?

Keep your airfield recognition up to scratch by giving a name to this airfield somewhere in Britain. If you don't know it or guess it straight off, here are some clues to help you.

The name of the Airport Manager is Mrs. E. Bickerton

The name of the Fuel Supervisor is Mr. Marshall Dunn

The main runway headings are 01/19 and 08/26

The height of the airfield is 249 feet AMSL.

Add the lifeblood of any airport AVGAS 80 and AVGAS 100/130.

The tower frequency is A/G 123.5 Mc/s.

Taxis, Public Transport and Hire Cars are available.

Dining and Hotel facilities nearby.

GOT IT YET?

Here's another clue. Beware—shooting near the airfield.

Answer Denham

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Why is the Minuteman missile important to future electronics needs?

Today's Minuteman represents more than a super-reliable missile. It is a spearhead of electronics progress... the forerunner of even more advanced micro-electronics systems. The micro-electronics advances pioneered by North American Aviation/Autonetics can now be applied to future systems.

In the Minuteman I programme, Autonetics systems met or surpassed goals of reliability, accuracy, and weight. Improvements in reliability reached up to 700% higher than contract objectives. This was accomplished while lowering weight by 15% and increasing accuracy by 30% beyond contract requirements.

The fully-integrated micro-electronics system built by Autonetics for the Minuteman II programme represents 99% of all electronics in the missile except for the re-entry vehicle. In addition to the airborne guidance and flight control systems, Autonetics provides the supporting automatic ground checkout and alignment equipment.

This totally integrated system is proving itself in the Minuteman II... and establishing a whole new standard of reliability for electronics systems.

Autonetics, one of the world's largest electronics producers, is uniquely qualified and experienced to help the Free World meet the need for lightweight, reliable electronics systems for use on land, sea, air and in space.

North American Aviation Autonetics Division

European Headquarters: North American Aviation S.A., 29 Rue de la Coulouvrenière, Geneva, Switzerland

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Retd.)

WE are still waiting, expectantly and hopefully, for the Government's long-promised Defence Review; but so far no one has succeeded in eliciting even an approximate date for its publication. While we recognise, of course, the advantage of taking plenty of time over such a vitally important investigation, we cannot forget that its very importance gives it urgency; particularly as important decisions must await its publication, and some may have to be taken even before it is published—as was the decision drastically to reduce the Territorial Army and to change its name and function.

The Canberra Replacement

The cancellation of the TSR.2 is still a sore point with many members of parliament, and the Canberra replacement has been the subject of numerous questions in the House. It has often been said in reply that TSR.2 would not have been as suitable for the Royal Air Force as its backers appear to have thought, and that a better aircraft will be obtained and a considerable saving of money effected by purchasing the F.111 or some similar aircraft from America. One cannot, however, ignore the fact that TSR.2 would have been constructed in this country and the money spent on it would have remained with us. If it really was unsuitable, there is no more to be said for it; but it does seem a pity that the British aircraft industry could not be given the opportunity of producing the replacement.

And now the Ministry of Defence is considering the relative merits of the F.111.A and the Spey-engined Mirage IV. As we said above, and as Ministers frequently repeat in their replies in the House, such decisions must depend upon the completion of certain stages in the Defence Review, which stages do not appear to have been completed yet. Moreover, F.111.A and F.111.B are still in their prototype stages and, being of foreign design and manufacture, will certainly require "Major and expensive modifications in order to satisfy British service requirements" (Sir Tufton Beamish). But Mr. Healey (Secretary of State for Defence) wrote, on 14th December, 1965, that "there is no U.K. interest in purchasing the F.111.B"; so that leaves F.111.A—or what?

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On the previous day (13th December), Mr. Healey said: "In many respects, the F.111.A is superior to the TSR.2, particularly in radius of action and flexibility;" and ". . . it would be a mistake to take a decision on the Canberra replacement separately from other major decisions on the future structure of our forces . . . I have therefore asked Mr. McNamara to postpone the initial option on the F.111.A for two months until 1st March, and I am glad to say that he has agreed to this request." Asked whether that indicated that the Defence Review would be completed and published by 1st March, 1966, the Secretary of State for Defence replied evasively. "We shall put," he said, "*the most comprehensive statement possible* of our future defence policy and the forces structure to support it in next year's Defence White Paper." (*The italics are mine.*) So, even if the Defence Review is not complete by then, presumably some of its findings and conclusions may be expected in February, 1966.

The question of "what sort of advance strike reconnaissance aircraft, if any, the country should order in the future" continued to exercise the minds of M.P.'s; and it was raised again on the Motion for the Adjournment on 13th December, 1965.*

Mr. Robert Carr spoke eloquently on the capacity of the British aircraft industry to produce aircraft that would fully satisfy the requirements of the R.A.F.; and he again emphasised the absurdity of purchasing F.111 aircraft from the United States for dollars and thus adversely affecting our balance of payments. He suggested, as possible alternatives: (i) no Canberra replacement at all; (ii) the British produced Buccaneer in its most advanced form; or (iii) the French Mirage IV with Rolls-Royce Spey engines and British avionics systems. His arguments against the purchase of F.111 aircraft were these: (i) it would leave a gaping void in the order load of the British aircraft industry; (ii) it would undermine European confidence in the fruitfulness of co-operation with this country in aircraft production; (iii) it would obviously add enormously to our balance of payments problems; and (iv) it might, in the long run, make Britain—and perhaps Europe—dependent on the United States for military aircraft and perhaps also, in the end, for major civil aircraft as well. No aircraft industry, he explained, could produce major civil aircraft at a reasonable price without getting a reasonable share of military orders to reduce the incidence of overheads on units of construction. And he quoted *Flight* of 9th December, 1965, which had said that the purchase of the F.111 would "at a large cost in dollars both strengthen Britain's competitors and jeopardise her alliances."

Mr. Joel Barnett practically accused Mr. Carr of "barking up the wrong tree." He admitted that if the R.A.F. were satisfied that the F.111 would enable them to fulfil their commitments, then the Government would have to consider that advice very carefully. But he "questioned the commitments." He suggested that the purchase of F.111 would commit us to an "East of Suez" role for a definite future period; and that, in fact, it was the Government's policy to reduce, and finally shed, our commitments in the Far East. If that were so, then there was, in his view, no

* Hansard, H. of C., 13th December, 1965, Cols. 974-1042

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need for the F.111 or for the Buccaneer or for the Mirage IV, in that role at least; and that our aircraft industry and the French aircraft industry must look elsewhere for ways of maintaining their production and trade.

Mr. Julian Ridsdale took the opposite view. He was convinced that we should have "a role to perform East of Suez, in co-operation with our Allies, for many years;" and for that reason he strongly advocated the ordering of a successor to the Canberra. He was sure that the R.A.F. needed a high performance tactical strike and reconnaissance aircraft; and he had been much disappointed at the cancellation of TSR.2. He doubted whether the Spey/Mirage, which was at present designed as a high-flying aircraft for dropping nuclear bombs, could be adequately converted for "the more demanding role of low-level strike and reconnaissance." He favoured Anglo-French co-operation, but not at the cost of our defence potential.

Sir Harry Legge-Bourke spoke about swing-wing aircraft. "Variable geometry," he said, "is the great future for all types of aircraft; and Britain has played a very important part in promoting it." He reminded the House that Dr. Barnes Wallis introduced the concept of variable geometry into this country; and that he had later gone to the United States and placed his knowledge at the disposal of American manufacturers. Should not this fact, he asked, be taken into account when fixing the price of military aircraft purchased by us from the U.S.A.?

Mr. Cyril Bence was all in favour of co-operation with the French in aircraft design and manufacture; but he did not believe that the Mirage could be satisfactorily converted for low flying nor that Rolls-Royce, who were already producing Spey engines for the Phantom, could also produce them in sufficient quantity for the Mirage. He suggested that the F.111 would be economical in cost because our order would be small in comparison with the total number being produced for the United States Air Force.

Mr. Roy Jenkins (Minister of Aviation) wound up the debate. He assured the House that no decision on the Canberra replacement had yet been made by the Government; only the option on the F.111 had been extended. He outlined the considerations which would be in their minds before any such decision were taken. These were: (i) the R.A.F. must be given the best plane for the roles which it has to fulfil at the time that it is needed; (ii) this must be done at the least possible cost to the nation, taking into account both budgetary and balance of payments considerations; and (iii) it must also be done so that the best possible prospect for the future is offered to the British aircraft industry and for Anglo-French and even wider European co-operation. Unfortunately, he added, those considerations did not all point in the same direction. They pointed, in fact, in many different directions. But there was one direction in which they certainly did not point, and that was "back towards the TSR.2."

Finally he told the House that "the Government will have the Defence Review brought to the position in which it will be contained in the White Paper before a decision (to purchase the F.111 or any comparable aircraft) will be taken." And he concluded: "In our decision on a Canberra replacement, we shall pay the greatest

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possible regard to industrial considerations, both in relation to our own firms and to the prospects for Anglo-French collaboration; but let us not forget that, at the end of the day, the object of ordering a Canberra replacement, or indeed any other military aircraft, is not to serve industrial convenience but to provide aircraft for the Royal Air Force."

Defence Economies

On 24th November, 1965, the Secretary of State for Defence (Mr. Healey) was asked several questions concerning the economies he hoped to make as a result of the reorganisation of defence commitments.

In reply, Mr. Healey said that it was the Government's intention that our total defence expenditure in 1969-70 should not exceed £2,000 million at 1964 prices. In reply to a supplementary question, he added that there was no saving to be effected by reducing garrisons overseas, except in foreign exchange, unless the men who are released by the reduction of the garrisons are then demobilised. The question was not that of a reduction of garrisons or the closing of bases but of the military tasks which the nation was called upon to perform.

Asked whether the "tremendous burden of B.A.O.R." could now be "slashed" in view of the statement in the Defence White Paper of 1965 that the danger of a Russian invasion (of Western Europe) was now remote, he answered: "One of the reasons why the danger is reduced is the existence of B.A.O.R. and N.A.T.O., and we do not want to restore the threat by removing what has caused it to disappear."

Family Baggage

Commander Pursey asked the Secretary of State for Defence, on 10th December, 1965, how many months are required to transport Royal Air Force families' crated personal belongings from Germany to their homes in this country, and what steps are being taken to reduce delays.

Mr. Millan replied (on behalf of Mr. Healey): "Apart from crated personal baggage which has to be held at Woolwich while a claim is presented for (import) duty, the average interval between despatch from Germany and arrival at the home address in the United Kingdom has been about four or five weeks, including Customs clearance. The recent experimental introduction of R.A.F. pantechnicons, which now convey about one-third of R.A.F. baggage from units in Germany to Woolwich without unloading, and the routing of baggage direct from the R.A.F. sidings at Woolwich instead of through Plumstead railway station (except in inclement weather), has enabled the transit time to be reduced to three weeks or less.

"The baggage normally remains at Woolwich for one day if it does not require Customs examination; or for up to ten days if it does, but is not found dutiable. Conveyance from Woolwich to the home address is by goods train and British Railways delivery transport. The baggage of some 75 families from Germany is currently held at Woolwich. About one quarter of this is awaiting Customs clearance and the rest is awaiting payment of Customs duty."

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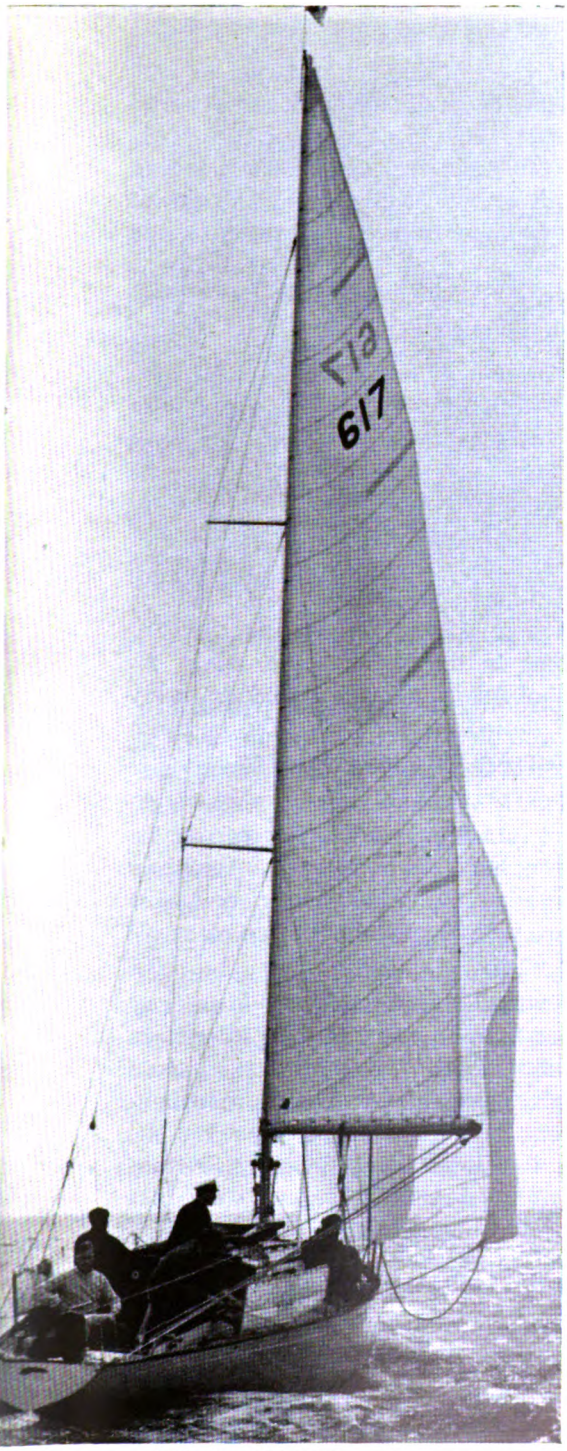

"The Dambuster"

SAILING

R.A.F. SPORT

By A. F. Tinsley

FOR many joining the Royal Air Force, especially sailing enthusiasts who found "Civvy Street" too costly for indulging their favourite pastime as fully as they would have liked, it must come as a pleasant surprise to discover what tremendous scope for sailing the R.A.F. offers. It has everything — dinghies, pleasure yachts and ocean racers— for the asking, and for only a modest subscription to one of the many clubs in Britain alone which comprise the R.A.F. Sailing Association, everyone from Air Marshals to the most junior ranks can enjoy this happy, healthful sport. Overseas, too, almost wherever the Air Force serves, there is sailing, mostly the year round—at Malta, Cyprus, Gibraltar and Aden, at Gan in the Maldives, on Arabian waters, in the Far East, North Africa, Australia and Germany. At all these places sailing goes on against picturesque and often exotic backgrounds.

In Britain just now, on lakes, rivers, canals, reservoirs, flooded quarries, and at sea, a new season is beginning, which will keep R.A.F. sailing men and women busy until the late autumn, riding the waves and the wind under thousands of square feet of sail, either just for pleasure, or in exciting competition, Station v. Station, Command v. Command, Service v. Service.

The R.A.F. enjoyed another rewarding season last year, and 1966 should prove equally fruitful. One of its outstanding events will be the appearance in competition of the Association's fine new ocean racer, "Contrail," soon to join the hunt for

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victories and trophies along with the already tried and triumphant "Dambuster."

This year represents the 17th season in an R.A.F. sailing story begun in 1949 when the R.A.F.S.A. was formed with a handful of boats and members and a charter which dedicated it to bringing sailing within the reach of all ranks of both sexes. Today in Britain alone, it has 90 clubs, some 1,300 members, and as fine a fleet of some 250 assorted craft as can be found in any Service in the world. The vow of 1949 has been kept. Sailing HAS been brought within the reach of all. A succession of keen committees has seen to that. Help in cash and kind from the R.A.F. Sports Board and from that great Services benefactor, the Nuffield Trust, has done much to bring the Association to its present happy, thriving state.

At the administrative helm a succession of Air Officers have served as R.A.F.S.A. Commodores; no "arm-chair admirals" just steering the Association along from shore, but keen, tiller-happy skippers themselves, who have taken their own active parts in all kinds of sailing. First of them, and still as keen a sailor as when he helmed for Great Britain in the 1948 Olympics, was Air Marshal Sir Arthur McDonald. Succeeding him came Air Marshal Sir Edward Chilton, truly a man of the sea, not alone in sailing, but through years of association with R.A.F. Coastal Command. Air Commodore Frank Hume, who long ago pioneered R.A.F. sailing in Germany, came next. Today the Commodore is Air Vice-Marshal Richard Ayling, a helmsman who is equally at home in dinghy or ocean racer. As inevitable Service postings have taken their toll of Association committeemen, many have contributed their services to sailing and moved on, their places to be taken year by year, however, by others who have taken over the reins at the organisational end of dinghying, cruising and ocean racing.

Steadily built up through the years, dinghies form by far the largest part of the R.A.F.S.A.'s fleet, and satisfy the sportive needs of hundreds of members. Among its 240-odd dinghies, 113 Fireflies comprise the largest fleet of Fireflies under one burgee in Britain. There are also many Albacores, over 30 Enterprises, and an extensive assortment of other types to choose from.

Some years ago, committee foresight inaugurated a clever scheme—a series of seven Sailing Centres strategically placed about Britain, where dinghies from clubs in surrounding areas are pooled to allow more sailing for more people; where experienced Service helmsmen teach beginners the sport; and where better boat maintenance and supervision, and more efficient administration are among the advantages. Headquarters of the R.A.F.S.A. is still on the famous Welsh Harp Reservoir at Hendon, that remarkable London-locked stretch of water which has seen hundreds of sailing contests through the years, but since the Association first went to Hendon so long ago, it has spread its sails far out over Britain. In 1964, Plymouth Sound was chosen as the annual venue for the R.A.F. Individual Dinghy Helmsman Championships for the Brady Cup—the Association's biggest dinghy event. Nothing could have more eloquently illustrated the strength of R.A.F. sailing. From Britainwide, crews trailered their dinghies to that historic stretch of water, and a great fleet of 65 Fireflies contested the six races over three days. It was a sight

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Fireflies jockeying for position on the Medway during the 1965 Inter-Services Team Dinghy Championships — eventually won by the R.A.F. for the sixth successive year and the eighth time in 10 years.

such as Plymouth Sound had probably never seen before. But it was even surpassed at Plymouth last year, when 76 boats crossed the starting lines. The two meetings were masterpieces of organisation, major credit for which went to Squadron Leader Ron Street, Rear-Commodore (Dinghies), who, on his retirement from the R.A.F. earlier this year was honoured by the R.A.F.S.A. by being made an honorary life member.

For ocean racing the Association launched two fine yachts in 1960 - 62, both of them Nuffield gifts costing, together, some £12,000. They were "Jethou," a masthead sloop launched in 1960, and now given over to pleasure cruising; and "Dambuster," a sloop-rigged Class II racer launched in 1962. She carries a famous name and number (617, commemorating the great bomber squadron of Mohne and Eder Dams fame), has sailed into watery battle many times, and has acquitted herself nobly. "Dambuster's" finest hour came last year when, scoring a hat-trick, she won all three Inter-Services ocean-racing contests—the Princess Elizabeth Challenge Trophy, and the Channel and Fastnet Races. Now, "Contrail" has arrived to join her—a beautiful Class III sloop built at Cowes by W. A. Souter & Son, Ltd., and designed by Illingworth and Primrose of Emsworth. Her "vital statistics" are: Length overall 31 ft. 8 in.; waterline 24 ft. 6 in.; beam 9 ft. 4½ in.; draught 5 ft. 10 in. Half her cost has been met by the Nuffield Trust.

The Association's 1966 dinghy fixture list is lengthy, and its members will race in some 16 events in Pegasus, Firefly, Albacore, Mermaid, Fireball, Enterprise and G.P.14 dinghies in London, Middlesex, Hampshire, Essex, the Isle of Wight, Devon and Suffolk. The season opener will be the "Victory Trophy" contest in Pegasus

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dinghies at Littleton Reservoir, Shepperton (April 23 - 24), an event involving the Navy, Army, R.A.F. and Civil Service, and which the R.A.F. has yet to win. The trophy, shaped as an anchor, was fashioned from timber taken from Nelson's flagship. In Mermaids at Seaview, Isle of Wight (July 9 - 10), the Air Force will try to regain the Inter-Services keel-boat team championship. As the season wanes the annual Inter-Services Team Dinghy Championship in Fireflies, on Grafham Water, Hunts., or the Welsh Harp, will see the R.A.F. defending the title. In 1965 it won the event for the sixth successive year and the eighth time in 10 years. Soon after, at Grafham Water or Hendon the Combined Services will meet British Universities to close the season as far as official contests go. Victory has been heavily on the Services side in this annual fixture, and in the Services team R.A.F. helmsmen have been very much to the fore. Indeed, in the 1964 and 1965 contests, they formed 50 per cent of the Services helmsmen.

Chief Technician Douglas Newman (Thorney Island), the R.A.F.'s outstanding helmsman, who became a triple champion in 1965 by winning the R.A.F. title for the second year running, and capturing the National Single-Handed Firefly and the first Fireball dinghy championships, is expected to defend his laurels, and to race in the National Albacore and National Firefly Championships in which he was runner-up in 1965. An especially attractive R.A.F. event will be that between the R.A.F.S.A. and an R.A.F. team from Malta at Thorney Island (May 7 - 8).

For the pleasure-cruising side, the Association owns several fine yachts which it charters to parties of Service people for private cruises, and to others for expedition training undertakings, and in which happy days are spent visiting many interesting and delightful places. Last year in Britain some 250 Association members availed themselves of these craft, which were also utilised for training members as skippers. Of 16 who took skipper courses last year, all gained their tickets. The Association is striving to push this side of sailing, and largely to further it, the off-shore committee has been increased in membership.

On the ocean racing side, the aim is to build up more and more helmsmen and mates for use in "Dambuster" and "Contrail," both of which—"Dambuster" again and "Contrail" in her debut year—will be entered in all major Royal Ocean Racing Club events and in many lesser ones.

One could easily go on writing many pages about R.A.F. sailing; indeed, many pages about R.A.F. successes at the sport since 1949. But here that cannot be, and the foregoing is simply intended as a general picture of one of the most highly organised, best loved, and progressive sports of the many in the R.A.F. which await those who decide to get into Air Force blue. Like all R.A.F. sports, sailing is a pastime in which the sport is more important than the rank, and whether in tiny dinghy, majestic cruiser or speedy ocean-racer, Air Marshal and airman, Group Captain and corporal, squadron leader and sergeant sail together as shipmates and friends.

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LETTER TO THE EDITOR

FROM SQUADRON LEADER J. H. DYER, M.A., R.A.F.

No. 204 Squadron,
R.A.F. Changi.

The Editor, Royal Air Forces Quarterly.

Dear Sir,

I congratulate you and your editorial advisors on the new format introduced with Volume 5, Number 4 of your journal. The contributions to this issue, moreover, were more pertinent to the many problems facing the Royal Air Force today than in most of the recent issues; even my old friend John Long managed, for once, to extricate himself from the meshes of the Soviet politics-economic maze to point out the alarming potential of a rejuvenated Soviet Long Range Air Force! A most thought provoking contribution, the import of which, it is to be hoped will not be lost entirely by those who seem bent upon ensuring that Bomber follows Fighter Command into oblivion.

The archaic photograph, showing a Neptune and a Sunderland in formation with a Mark I Shackleton, illustrating the Air Officer Commanding-in-Chief's article on "Coastal Command" presented, however, a false and totally irrelevant "image". A whole decade has now elapsed since the last Neptunes and Sunderlands were retired, perhaps prematurely, from the Command; no Mark I Shackletons remain except in the rebuilt T4 training version. Furthermore, as far as I am aware, although submarines have on many occasions in the past hunted in packs, aircraft flying in formation have never been used to locate and destroy them! Surely an artist could have been found to produce at least an "impression" of the modified Comet, HS801, to draw attention to the forthcoming potential of the only operational command with a current rôle and a settled re-equipment programme.

The article itself was disappointing in but one important respect—the perpetuation of the outdated misnomer "Coastal" Command to describe what in fact has been for many years "Maritime Air Command", as many of our allies have for so long recognized in their own air forces. Another "false image" preserved by the traditionalists with utter disregard to changed circumstances!

Yours faithfully,

J. H. DYER.

EDITOR'S NOTE

We are grateful for this letter of congratulations on our efforts to improve the Royal Air Forces Quarterly; appreciation of the result of a lot of hard work is always encouraging.

Constructive criticism is not only equally welcome but is of practical help in making further improvements to meet the wishes of our readers.

Our lapse into past pictorial history might be excused, on the grounds that the article begins with Coastal Command's participation in the Second World War. The illustration depicted (in one group for financial reasons) the maritime aircraft of that period.

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"The Commandant requests the pleasure . . . . . "

By Kate Fisher

EVER since my eighteen-year-old son Jack entered the Royal Air Force College as a cadet, I had been dying to get a "mum's-eye view" of the place. So when my daughter, Anthea, and I received an invitation to an Open Day and Drill Competition, to be held there, naturally, we were delighted.

That evening, I 'phoned Jack at the Cadet's Mess. "Hello, darling, we're looking forward to the Open Day. How many visitors are you allowed?"

Jack answered cautiously, visualizing hordes of family, no doubt, "Better keep it down to four, Mum." So we invited Aunt Carol and young Robert, her eleven-year-old son. This pleased Anthea, who is fourteen, and a bit bossy.

We four arrived at Hitchin Station just before 10 o'clock on the great day. The budding horse-chestnuts made the countryside misty-green as we bumped along in the ancient taxi on the way to the Camp. We sailed through the gates, and were put down somewhere in the grounds. Uncertain where to go, we met the padre exercising his boxer dog. He directed us to the Officers' Mess where coffee was being served.

As we walked into the Mess I had a momentary pang. Was my velvet pill-box hat with its frothy veil too fussy? The pale-green coat I had bought for my eldest daughter's wedding last Spring didn't feel right today somehow, among the silk suits and elegant pull-on straw hats I saw all around me. However, Carol looked serene enough in her matching blue hat and coat, and the two kids seemed oblivious to everything but the need for refreshment, so we joined the throng round the coffee-pot, and prepared to enjoy our day out.

We sipped our coffee and surreptitiously eyed the other guests until it was time for us to move out into the early sunshine, and take our seats under the trees for the Drill Competition.

This is an important event in a cadet's year. The first-year cadets are divided into two squadrons "A" and "B" and they each perform set manoeuvres for half-an-hour at a time. The standard of drill is marked by a team of judges.

We shifted expectantly in our seats as the cadets marched on in front of us on the parade-ground. This was to be the first glimpse we had of our sons that day and all eyes were straining to pick out our own all-important reason for being there. Young

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Robert spotted Jack first. He was in "A" Squadron, "the little bloke in the middle of the rear rank," as he had described himself in his last letter home.

I looked along the rows of tense, white faces, as the smart lads drilled so perfectly under the trees, on that brilliant Spring morning. I wondered to myself, how, oh how, had they been taught to march so precisely, to carry themselves so upright, to look so altogether military in so few short months? My thoughts were interrupted by a volley of shots. The competition was over.

We were among the last to go into the cadet's Assembly Hall, where the result was to be announced, and there were only front seats left. The children planted themselves in the second row next to the Commandant's wife. I confiscated Robert's sweets, and told Anthea to stop sniffing.

The Air Vice-Marshal, who presented the trophy to the winning squadron, was a poppet. I shall not forget the way he looked over his half-spectacles when he welcomed us, expressing the hope that we approved of the way the College was continuing to build our sons' characters on the laudable foundations that we had laid. Everyone loved him for that!

The cadets shuffled excitedly at the back of the Hall. When "A" squadron was announced the winner, there was thunderous applause. The two kids started to cheer, but Carol soon put a stop to that with a couple of pokes.

As we were slowly drifting out of the Hall with the crowd, Jack came up behind and planted a hefty kiss on my cheek! This was my usually very reserved son! I felt suddenly very happy.

After sherry in the ante-room, we sat down to an excellent cold lunch, with a bottle of wine, which Jack poured. Even the two youngsters had a glassful! I glanced round the Mess. At the other tables cadets were looking after their families. Relaxed and cheerful now that their ordeal was over, they were pleased and proud to show off their new life to those who formed part of their old.

When we had finished lunch, Jack took us up to his own room. I had been waiting for this moment. Now, at last, I can picture him at his desk when he writes home, and see in my mind's eye where he puts the cake-tin when I send him "tuck" parcels.

He had cleaned everything to perfection. We took flying leaps from the corridor to his carpet, in order not to step on his beautifully-polished lino! Although in need of a wash we refrained from using his immaculate wash-basin, and just in time I managed to drag Anthea away as she was about to sprawl on his smooth counterpane. We dutifully admired his tidy wardrobe, the view from his window, and the way he arranged his bed so that he could manipulate the radiator with his toes.

When we had rested, and the effects of the lunch had worn off, we strolled over to watch the Inter-Squadron Rugby match.

On the way we visited the workshops, which were a wonderment to Robert especially when Jack pointed out to us the most accident-prone machines with a few gory first-hand details thrown in.

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After the workshops came the museum. This interested the older ones who remembered the wartime bombs and incendiaries on display. For the first time I saw the rear-turret of a Wellington bomber. I marvelled how Jack's father, a rear-gunner in the second world war, had managed to stow away in that limited space. How cramped he must have been on the long, cold, ten-hour trips. When we reached the Rugby ground the seats were all occupied.

"Please will you chaps give these two ladies your seats?"

I looked round as my son spoke, hardly believing my ears. Two cadets, unaware that we had been standing behind them, leapt from their seats as if they couldn't believe theirs either. In truth, this technical college was doing a good job on my hitherto bashful son. We were all very pleased when "B" Squadron won the match. It made up for their morning disappointment.

At four o'clock we joined the others in the Mess ante-room. Sitting comfortably round the room in deep arm-chairs and on sofas, we were waited on by the cadets who fetched us tea and cakes. Small brothers proudly helped.

The atmosphere was so different from the strained one of the coffee session. The elegant hats were off. Smart coats unbuttoned revealed homely cardigans, mothers and grannies were laughing and chatting. Small fry were crawling over the carpeted floor. The Commandant, who had "requested the pleasure of our company", had changed out of uniform and was strolling about the room, speaking to the guests.

Sunshine spilled in through the open French windows on the pleasant scene. The scent of the carnations and hyacinths on the massive mantelpiece was sweet. Too soon our time together was drawing to a close.

Jack arranged for a friend to take us down to the station in his old Morris Oxford. We all crammed in and arrived just in time to catch the "Honeymoon Special" back to Kings' Cross. It was "standing-room only", and we all arrived home smothered with confetti, looking as though we had just come from a church, not an Air Force Station. But it had been a lovely day!

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THE ROYAL AIR FORCE BENEVOLENT FUND was founded in October, 1919, by the late Viscount Trenchard to secure lasting benefits for the personnel of the Flying Services and their dependants in commemoration of their achievements during the Great War 1914-18.

A Memorial to the Officers and Men who lost their lives stands on Victoria Embankment overlooking the Thames, and was unveiled by H.R.H. The Prince of Wales in July, 1923. An inscription, in remembrance of those men and women of the Air Forces of every part of the British Commonwealth and Empire who gave their lives in the 1939-45 war, was unveiled by Marshal of the Royal Air Force Viscount Trenchard at a ceremony on 15th September, 1946.

The Fund exists for the relief of "distress" or need, actual or potential, among past and present members of the Royal Air Force, Royal Auxiliary Air Force, Royal Air Force Reserves, Women's Royal Air Force—and their dependants. It must, therefore, be prepared to help:—

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Expenditure on all forms of relief amounts annually to about £700,000. In the first year of the Fund's existence, 1919-20, it is noteworthy that the help given amounted to £919, and since then, a total of nearly £13 million has been disbursed on all forms of assistance. Of this amount over £12 million has been expended since V.J. day, 1945.

The Royal Air Force Benevolent Fund exists for a Service that trains as well as fights in the air, and provides relief not only for cases arising from casualties in war, but also for those arising from flying accidents and ordinary distress in peace. It must therefore be prepared to render help indefinitely, and not merely to meet temporary emergencies.

The Council trust therefore that the Service and general Public will respond generously and unremittingly to their appeal, and so enable the Fund to continue its increasingly valuable work.

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Book Reviews

Warplanes of the First World War: Fighters, Volume One, by J. M. Bruce (Macdonald & Co., Ltd., London; 188 pp.; fully illustrated; 12s. 6d.).

Among the most popular pocket-size aviation books of recent years was the series of potted histories of *Warplanes of the Second World War* written by William Green. The same publishers are now producing a series of uniform books dealing with the fighting aircraft of 1914-18 and have gone to the acknowledged expert on that era, J. M. Bruce, for the text. As in Mr. Green's books, this is illustrated by the best available photographs—many of them extremely rare—and three-view general arrangement drawings of a high standard.

This first volume in the series deals with British fighters arranged alphabetically from the A.D. Scout—in which the pilot sat in an elevated bathtub on the top wing—to the tiny Eastchurch Kitten. In between are famous names like the Avro 504C, D, F and K, Bristol Fighter, D.H.2 and Martinsyde Elephant. These machines will bring back memories to many readers of this journal; but how many will be familiar with the Alcock A.1, designed by the man who later made the first non-stop Atlantic flight, or the Parnall Scout of 1916? And how many could name the manufacturers of the Spider, Armadillo or Bobolink?

Inevitably, there are some strange-looking aeroplanes in this book, for they were designed little more than ten years after the first men left the ground in a powered, controllable aircraft. There was no such thing as an optimum design, and if a company thought that an extra wing might be useful, or that a pair of pusher propellers would be more efficient than one at the front, it simply built its prototype that way. Of one such, Mr. Bruce comments "During the evolution of fighting aeroplanes there have emerged from time to time aircraft that were dead-end designs and only marginally suitable for their intended function". On reading the history of this particular aircraft, one can see what he means!

In contrast, the brilliance of men like A. V. Roe, Frank Barnwell and Geoffrey de Havilland is reflected in designs that look workmanlike even today. The next volume will, presumably, include the products of the Royal Aircraft Factory and the Sopwith Company and will be awaited eagerly by the thousands of readers who have already cleared a space on their bookshelves for this latest in the series of fine aviation publications from Macdonald. J.W.R.T.

World Space Directory, Edited by Donald W. Dean (American Aviation Publications, Inc., 1001 Vermont Avenue, N.W., Washington, D.C. 20005, U.S.A.; 666 pp.; $16).

In a recent issue of *The Royal Air Forces Quarterly,* there appeared a review of the *World Aviation Directory* published by American Aviation Publications. It has been followed in recent weeks by the latest (Fall 1965) edition of the companion *World Space Directory* which, if it were possible, is even more indispensible as no other reference work covers the same field in such detail.

According to the publishers (I haven't counted them!), there are the names of more than 17,000 key personnel in 4,250 companies currently active in the missile, space and defence industries, with addresses and telephone numbers, details of the products of each company and of its capabilities. In addition to manufacturers, information is given on government agencies, research and professional organisations, industrial representatives, consultants, publications and colleges and universities. Inevitably, the entries for overseas countries are less detailed than those in the U.S. sections; but it is difficult, for example, to find any omissions in the couple of pages devoted to the British Aircraft Corporation.

To complete a most valuable collection of data, Section K of the *Directory* lists all current U.S. missile and space programmes, with details of the manufacturers involved, the purpose of the missile or space vehicle concerned and the current status of the programme. The entry on the Polaris missile runs to about 175 words and gives a surprising number of facts and figures in so little space. J.W.R.T.

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Supersonic Flight, by Basil Clarke (Frederick Muller Ltd., London; 224 pp.; illustrated; 35s.).

In this volume, Mr. Clarke traces the history of supersonic flight and tells his readers in considerable detail of the forthcoming problems and pleasures of supersonic airline travel. No journalist is better qualified to do so, as he has flown supersonically himself in Hunter and Lightning two-seaters of the Royal Air Force and is one of the few civilian members of the exclusive "1,000 Miles per Hour Club" in consequence.

Nitpickers will detect a few minor errors of detail here and there. It was, for example R. J. Mitchell and not Leslie Mitchell who designed the Spitfire; and it is far from true that "When the Second World War began . . . . Britain's fastest aircraft—actually in full operational squadron service—was the Gloster Gladiator." In fact, the R.A.F. had eighteen squadrons of Hurricanes and a smaller number of Spitfire squadrons on the outbreak of war. That the Hurricanes were well and truly operational was evidenced by the prompt despatch of four squadrons to France.

However, such slips are more than offset by the quality and details of the rest of the book. Here are the answers to almost all the questions likely to be asked by anyone but the most technically-informed expert. How does the speed of sound vary with height and temperature? How does the fuel system of a supersonic transport help to reduce the problems of kinetic heating and change of trim during landing? What progress has Russia made towards the construction of a supersonic airliner? How serious is the problem of the sonic boom? How does a "swing-wing" aeroplane change its wing sweepback?—and so on, for more than 200 fact-packed pages.

The Appendices are every bit as interesting as the body of the book. The main one, based on speeches and discussions by some of the world's most experienced airline pilots at a recent BALPA conference, gives a very complete picture of future supersonic transport operations, from the viewpoint of passengers, pilots, air traffic control officers and others. The remaining appendices list airline orders for supersonic transports and world air speed records from the 25.7 m.p.h. (Mach 0.034) of Santos-Dumont in 1906 to the current 2,062 m.p.h. (Mach 3+) of Cols. Stephen and Andre in a Lockheed YF-12A.

Between these Brazilian and American record flights, the pace was set by Britain for much of the time. The first records of more than 400 m.p.h., 500 m.p.h., 600 m.p.h. and 1,000 m.p.h. were claimed by British pilots. Britain pioneered the jet engine, which made everyday supersonic flying possible, and opened the first jet airline services; but the rot set in long before the last of these achievements was recorded.

At a press conference in 1946, Sir Ben Lockspeiser announced that Britain's research into supersonic flight was to be restricted to model tests, which were to prove almost valueless, leaving the Americans with a clear field in which to gain honour as the first nation to surpass Mach 1 in level, controlled flight. Despite such timid and unworthy decisions, which were detested by Britain's test pilots, Britain continued to lead the world in many fields of aircraft design. So much so that, in 1964, a new generation of VTOL and STOL combat aircraft under development in Britain promised to be the envy of the world. Then along came Mr. Wilson's experts, rating pennies in the exchequer more highly than survival in war, and cancelled the lot.

In his foreword to Mr. Clarke's book, Bill Bedford, Hawker Siddeley's great chief test pilot, comments: "If a country finds it necessary to kill many of its major military aviation projects, this not only deals a severe blow to the civil side of aviation but strikes at the very heart of technology and the associated influence it has on other important industrial spheres within that country." Such common-sense realism needs no further postscript, except that cancellation of the brilliant TSR.2 was a mistake that we shall regret for a generation or more. J.W.R.T.

Aircraft Profiles (Profile Publications Limited, Leatherhead, Surrey; fully illustrated).

According to the *Oxford English Dictionary*, a profile is "a drawing, silhouette, or other representation, of side view esp. of human face." The artists who produced black profiles of

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Aunt Agatha and Uncle Jim back in Victorian times would probably have been startled to realise how far their craft would be advanced one day by people involved with flying machines.

One of the gems of my own reference library is a slim book of silhouettes produced by the British War Office in the early months of the 1914-18 War. The quality of the solid black three-view drawings and perspective drawings is such that it must have been comforting to the user to learn that British aeroplanes could be recognised by the large Union Jacks painted on them, while German flying machines were marked with black crosses.

Some progress had been made by the start of the Second World War, due no doubt to the urgings of the (later Royal) Observer Corps; but the greatest advances have been made in the last 20 years. From the crude silhouette of 1939 has emerged the beautifully detailed and precise silhouette of today, as accurate as an engineering line drawing, and its offspring the three-view tone drawing. The ultimate, surely, is the three-view, four-view and sometimes five-view tone drawing in full colour which has become a feature of the *Aircraft Profiles* which burst upon the aviation scene last year.

Each of these monographs traces the history and service record of one type of aircraft, or of certain marks of a much-produced type. Typical is No. 5, written by J. M. Bruce and dealing with the Vickers Vimy bomber. It is 12 pages long, opens with a five-view tone drawing in full colour, has 20 photographs to illustrate the most detailed and comprehensive article ever written about this famous aircraft, and ends with five profiles (side-view drawings) in full colour, showing various markings and paint-schemes of Vimys, a very complete tablet of specification data, including lists of serial numbers allocated to Vimys, and a large table of weights and performance. All this, and more, for only two shillings. Little wonder that *Aircraft Profiles* are selling like the proverbial hot cakes, not only in Britain but overseas.

Originally, it was intended to market four *Profiles* each month, but sales quickly justified an increase to six a month. By the time this issue of the Quarterly appears, some 80 *Profiles* will be available singly, including the first of a series of new *Large Profiles*, running to 16 pages each but still costing only 2s. In addition, the first 24 are available in a beautifully-bound luxury book form at 3 gns.; Nos. 25 - 60 in a similar form cost 4 gns. The emphasis is largely on combat aircraft of the two World Wars, plus a small number of non-military machines like the Supermarine Schneider Trophy seaplanes and the Gee Bee racers which influenced military design. The authors are in all cases acknowledged experts, of several nationalities.

J.W.R.T.

The Flying Cathedral, by Arthur Gould Lee (Methuen, New Fetter Lane, London, E.C.4; 272 pp.; 33 illustrations; 30s. net).

No history of aviation would be complete without reference to the great contribution made to the conquest of the air by Samuel Franklin Cody (more widely known as Colonel Cody).

Added to the aviation interest in this book is the biographical story of a famous Texan Cowboy, Bronco-Buster, Frontiersman, Circus Sharp Shooter, Horse Track Rider, Barnstormer, Inventor and above all a Great Showman.

Young and old will enjoy this fascinating book. What boy today does not play "Cowboys and Indians" and in doing so perpetuate the memory of Colonel Cody.

In the latter years of his life his inventiveness, courage and determination to conquer the problem of getting a man into the air in a heavier than air machine, made him one of the great figures of his time.

The title of this book will undoubtedly arouse in the minds of those early aviators still with us, Colonel Cody in his individualistic dress surmounted by a still stranger flying helmet and what in those days were seemingly enormous bi-planes known as Cody's Flying Cathedrals.

There can be but few flying men of today who have not seen that gnarled trunk of an old tree at Farnborough aerodrome known as "Cody's Tree"; a tangible reminder of this pioneer's unusual activities. Having drawn one of his many curious types of flying machines to this spot with a horse, he would tether it to this tree.

This most interesting book will be enjoyed by all its readers and it will arouse nostalgic memories among many of them.

A.H.S.

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The 'Royal Oak' Courts Martial

Leslie Gardiner

'The Admiral wished to make the Commander of the cruiser instal a JAZZ BAND!! The Commander, who knew the spirit of his sailors, refused. His second supported him. Admiral Collard then sent ashore his two disobedient officers. . . . That formidable weapon of imperialism, the British Navy, is beginning to totter.'

And totter it did, although in his eagerness to splash the story the foreign journalist had got his facts wrong. British Parliament and Press got their facts wrong too, and for a few bewildering days in the spring of 1928 rumour and counter-rumour swept the nation. The truth, when at length it came to light, was scarcely more credible than the wildest inaccuracies had been.

The scene was Malta. The explosion came on a flagship's quarter-deck: an angry outburst over the performance of the Marine band during a dance. The result was more than the summary sacking of three distinguished officers. It led to the most astonishing courts martial of the century.

The *Royal Oak* affair suffered from ill-judged attempts to hush it up; from irresponsible badgering in Parliament; and from opportunistic scandalmongering in the Press. The principal characters behaved with dignity and reticence, as they firmly believed the good of the Service required them to; but, although the newspapers that had cried *'Revolt in the Fleet!'* afterwards confessed that *'Three Men in a Boat'* would have made a better headline, those characters were doomed; and they moved to their destinies with the inevitability of an *exodos* of tragic heroes in a Greek drama.

In THE *ROYAL OAK* COURTS MARTIAL Leslie Gardiner portrays in full for the first time a memorable naval scandal. The author is not out to call up old ghosts, to criticise or apportion blame. Dispassionately told with his customary skill and clarity, his story is the fruit of a long detailed study of the facts and of the contemporary scene around them.

THE *ROYAL OAK* COURTS MARTIAL will be a valuable addition to the history of the Royal Navy between the wars, for here is the complete, authentic account of significant happenings that have never been fully understood within the Service and are virtually unknown outside.

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The Aircraft of the World, by William Green and Gerald Pollinger (Macdonald & Co., Ltd., London; 360 pp.; fully illustrated; 95s.).

More than twelve years have elapsed since William Green first attempted to gather between the covers of one volume details of virtually all aircraft types known to be flying in the world, irrespective of age, importance or nationality. That first pioneering edition contained 160 pages and was good value at 25s. The latest edition, just published, costs nearly four times as much but is even better value. Its 360 pages provide data and photographs of well over 1,500 individual types of aircraft, with three-view silhouettes of nearly 800 of them.

How does one explain the immense growth in size of a book that was considered to be comprehensive in its original edition? The answer is simple and, in itself, of interest. Many hundreds of new types have made their appearance, yet most of the old-stagers that found places in the 1953 book have avoided relegation to the scrap-heap or honourable retirement in the world's air museums. In addition, the "do-it-yourself" amateur construction movement has grown immensely during the past decade and now contributes a very large number of imaginative designs (and even more imaginative names) to the airborne inventory. Even the Soviet Union produces its quota of this form of private enterprise.

Nor are the "veteran cars" of the air neglected. For the first time, in this edition, six pages are devoted to a representative collection of 46 of the veteran and replica aircraft known to be in flyable condition. For sheer nostalgia, this section has no equal anywhere. The very earliest days of practical flying are illustrated by a genuine Blériot monoplane and a replica Bristol Boxkite built for the film of *"Those Magnificent Men"*. No fewer than eighteen types recall the days of aviation's first great war, covering everything from the Fokker Mononplane to the Nieuport V-strutter and Sopwith Snipe. There are, of course, a Hurricane, Spitfire and Swordfish among the World War II types—making one feel old at the thought that these so-well remembered aircraft should now be classed as veterans.

Aircraft of the World is an immense tribute to the patience, industry and ability of Mr. Green. He is never content with the same old hackneyed photographs of the aircraft he describes, but has gathered together a remarkable collection of pictures from every conceivable source. There is a Vampire F.Mk.3 of the Mexican Air Force with ferocious-looking sharks-teeth insignia, a Cataline amphibian of Trans-Australia Airlines, an F-86F Sabre of the Thai Air Force, a little-known Beriev Be-8 amphibian of the Soviet Naval Air Arm and, among the Soviet "home-builts" the hitherto-unrecorded Leningradets and tailless MAI-62.

Some reviewers have attempted to compare *Aircraft of the World* with *Jane's All the World's Aircraft,* but this is not valid. If one requires information on aircraft of the current era, in the greatest practicable detail, the answer is *Jane's.* If one wants details of the greatest practicable number of aircraft in compact form, *Aircraft of the World* is the answer. One trusts that no respectable library or aviation bookshelf would dare to consider itself complete without either book! J.W.R.T.

Sagittarius Rising, by Cecil Lewis (Peter Davies, London; 332 pp.; 25s. net).

Nearly thirty years have passed since, this most interesting autobiography of a pilot in the First World War, was first published in 1935. Nevertheless, its reappearance will be welcome, as the author not only writes well but in this book he describes with considerable accuracy the conditions that existed in France during the war activities of the Royal Flying Corps.

His contemporaries will find very little to criticise and many nostalgic memories will be revived by Cecil Lewis's descriptive skill in recording the events of a nearly forgotten war.

The sons and grandsons of those who served in the Royal Flying Corps should most certainly read this excellent book, even if only to compare the conditions of fifty years ago with those of the Second World War and military aviation today. Not only will they learn much by so doing, but really enjoy a story in which there is not a dull moment. A.H.S.

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The Royal Air Force, by John W. R. Taylor with illustrations by Victor G. Ambrus (Oxford University Press, London; 48 pp.; 54 coloured illustrations; 17/6 net).

This pictorial history of military aviation measures 8 ins. x 11 ins. The accuracy of the military aircraft mentioned is assured, in that the author of this book is the present Editor of "Jane's All The World's Aircraft" and they are beautifully illustrated by coloured drawings by Victor G. Ambrus.

It does not begin, as so many histories of the Royal Air Force do, with the formation of the Royal Flying Corps, but from 1861, when an officer of the Royal Engineers (Lieut. George Edward Grover) suggested to the War Office the potential usefulness of aircraft in battle.

Although it was to be many years before British military aviation changed from its amateurish status into a professional air arm in the First World War and subsequently into the highly effective striking air power of today, balloons had been used in war in 1794.

In the first four pages there is an interesting account of the development and use of balloons for military purposes, followed by experiments with man-lifting kites, in which that well known figure Samuel Franklin Cody ("Colonel Buffalo Bill") played so great a part as he did, also in the earliest development of heavier than air machines.

There follows the better known story of the formation of the Air Battalion (airships) in 1911 and R.F.C. in 1912.

The beautifully coloured drawings of our earliest battle aircraft are most fascinating: the "Farman biplane", "Vickers Gunbus", "Bleriot Monoplane" and "B.E.2C.", will arouse nostalgic memories of "The Few" still living who flew these aircraft in those now far off days.

In the short space of so few pages, it is remarkable how the author has managed to cover all the "highlights" of military aviation and the most well-known military aviators who were the founders of the present Royal Air Force.

In the between war period he has included our part in the "Small Wars" on the North West Frontier of India, Afghanistan, Somaliland and in the Middle East. There are coloured drawings of such aircraft as the "D.H.9A", "Bristol Bulldog" and "Victoria".

The final pages deal briefly, but adequately for a pictorial history of this kind, with the Second World War period; again supported by coloured drawings of the best known aircraft of 1939 to 1945.

To round off for good measure the illustrations conclude with the "Victor", "Lightning" and "P.1127 Kestrel", an improved version of which *may* be among the aircraft of the Royal Air Force in 1969.

It would indeed be a pity if anyone interested in military aviation failed to obtain a copy of this artistic pictorial history of our Royal Air Force. A.H.S.

The Art of Survival, by Cord Christian Troebst (W. H. Allen, London; 312 pp.; 28 illustrations and 10 line drawings; 35s. net).

First published in 1963, it has now been translated from the German by Oliver Coburn, offering the English speaking nations, not only a fascinating adventure book, but one full of useful information for those who might at some time be faced with an emergency and whose very survival could depend upon specialized knowledge.

There can be but few who have more need for this specialized knowledge than the air crews of our air forces: this has been catered for by the establishment of "Survival Schools" available to the air forces of NATO nations, the staffs and students of which will find in this book a good deal of material for useful discussion and possibly constructive criticism. A very wide range of nearly every kind of emergency is covered. The vivid descriptions, in some cases supported by illustrations, of the incredible experiences of people who have—or have not—survived such emergencies, with the author's observations on the reasons for their success or failure, makes fascinating reading. For all who travel widely the Art of Survival offers useful and practical information, dramatized by the examples of successful survivals and the tragedies of those who perished from lack of specialized knowledge which would have made their survival possible. A.H.S.

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JANE'S ALL THE WORLD'S AIRCRAFT — 1965 - 66. Compiled and edited by John W. R. Taylor, F.R.Hist.S., A.R.Ae.S. (Sampson Low, Marston & Co., London: 533 pp.; 1,200 illustrations; £8 8s. 0d. net).

The 1965-66 edition in 533 pages (an increase on the previous edition) records the development and progress with complete specifications of Aircraft, Drones, Airships, Sailplanes, Guided Missiles and Rockets; as well as the Aero Engines and Air Cushion Vehicles spread throughout 34 nations — covering as the title proclaims " All The World's Aircraft."

This massive volume 9 in. x 13 in. (1¼ in. thick) with its 1,200 illustrations, of which nearly 650 are new, 533 pages of text, plus 25 pages of Index covering the last 10 editions, must indeed be the most comprehensive and authentic record of aircraft in the world.

The Editor's views in the *Preface* on some of the outstanding events and changes in the world of aviation, bring readers up-to-date in what has transpired in 1965/66 and possibilities of future developments.

The fact that 70% of this edition is exported to 100 different countries is sufficient proof of the esteem in which " Jane's " is held throughout the world.

Some Points of Interest

Information this year from official sources in the Soviet Union has made the Russian " Aircraft " and " Guided Missiles and Space Vehicles " sections the most comprehensive, up-to-date and accurate records of current Soviet aerospace technology available anywhere. In " Jane's " for the first time are good photographs of Soviet anti-shipping guided missiles under the wings of jet-bombers; details of the Tupolev TU-144 supersonic airliner, which may fly before the Concord; and information on more than 40 different Soviet missiles and spacecraft —much of it never before published — illustrated by 33 photographs.

Cancellation of the three major British Military aircraft development contracts during the past year (TSR.2, P.1154 and HS.681) has made the export of commercial aircraft vital for the future of Britain's aircraft industry. Does the industry sell sufficient airliners to keep itself alive? Statistics in " Jane's " show that Britain sold a total of 31 BAC One-Elevens, Tridents, VC.10's and Super VC.10's to domestic and foreign customers in the twelve months after the 1964/65 edition was printed. By comparison, the American Boeing and Douglas companies sold a total of 455 jet airliners in the same period.

More than 50 international design, development and production programmes are being undertaken by the aircraft companies of Western Europe. Details of these given in the *Preface* show that Britain is becoming deeply involved in this " Europeanisation," but warning is given that joint projects are beneficial only when they produce exactly the right aircraft needed by the partners.

This year's " Air Cushion Vehicles " section leaves no doubt of the leadership of British Manufacturers. In particular, Westland had sold 18 SR-N5's and N6's by September 10, 1965, and now have contracts for the first very large (160-ton) cross-channel ferry hovercraft. This is regarded by experts as the " breakthrough " that will soon see large Hoverships in world-wide service, carrying motor vehicles and passengers across the seas at 80 knots or more.

This edition suggests that new achievements may be planned by the Soviet Union in 1967 to celebrate the 50th anniversary of the Revolution, including perhaps the first flights of the Tu-144 supersonic airliner and even the first attempt to put a man on the moon.

A remark once heard at an Aviation meeting that " If it is not in 'Jane's ' it does not exist," briefly sums-up the confidence in this famous book on aircraft.

When reviewing " Jane's " in the " R.A.F. Quarterly," which itself circulates throughout more than 50 nations, the first thought is that no library in any air force in the world should be without this invaluable reference book; but obviously its circulation is not limited to military circles and everyone with aviation interests, whether personal or professional, should possess this valuable record of everything that is airborne throughout the world. A.H.S.

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Baker Street Irregular, by Bickham Sweet-Escott (Methuen, London; 277 pp.; 35s. net).

The inside story of the world wide activities of the Special Operations Executive by one of its senior officers, should help all concerned with politico-military problems to a better understanding of the overall purpose of Special Operations.

Hitherto several books have been published on the individual exploits of those serving with the S.O.E., but its organisation and world wide activities could only have been known to the senior executives concerned.

The number, whether civilian or Service personnel, who had even heard of this para-military organisation, must have been astonishingly few.

"Baker Street Irregular", after being banned by the Authorities for ten years has, after some "Blue Pencilling", now been released and it is a fascinating account of the difficulties, failures and successes of the Special Operations Executive. A.H.S.

NEW YEAR PROMOTIONS

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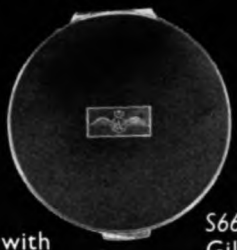

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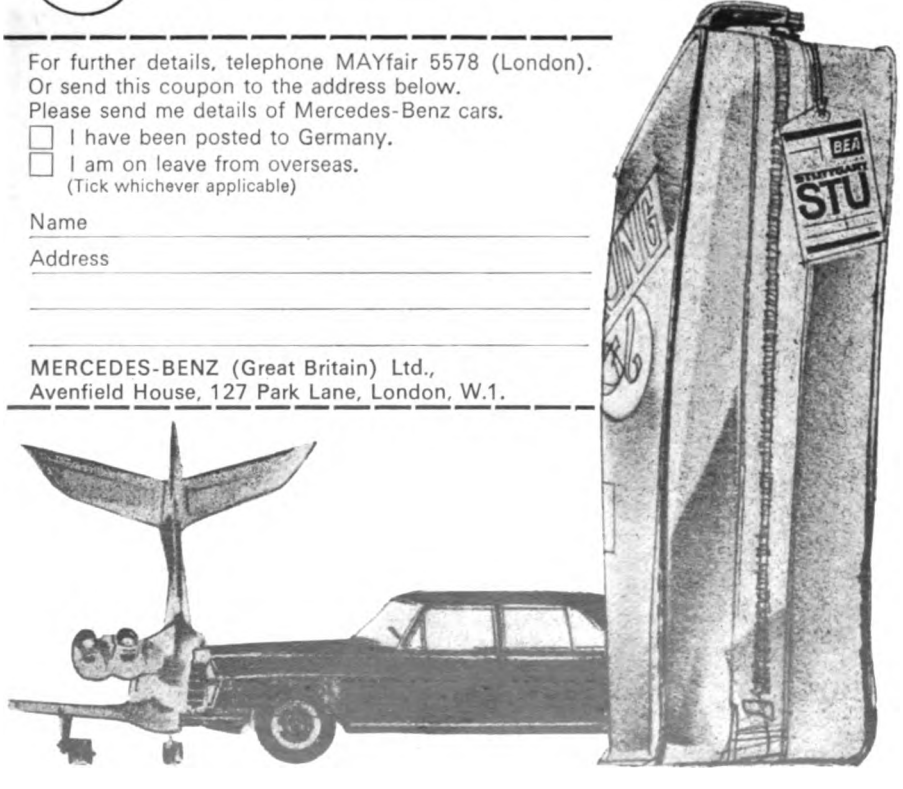

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COVER PICTURE

NEW R.A.F. FIGHTER-BOMBER

50 of these supersonic variable-wing F-111A being delivered to the R.A.F. by Jan. 1970

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The United Nations— Myth & Reality

By Dr. C. L. Wayper, M.A., Ph.D.

THE United Nations, we are told, is a world government in embryo. Our salvation demands that we make it so in fact. Three things, however, it is said, impede its growth.

The first is its unnecessary institutional weakness. This, it is said, is evident in the presence of the veto which paralyses the Security Council, the absence of a permanent and strong international peace-keeping force which hamstrings the Secretary-General, the failure to insist that all members submit their disputes to international arbitration which makes a mockery of the International Court, the acceptance in the General Assembly of the doctrine 'one state one vote' which, by giving little Mali as much influence there as the mighty Soviet Union, creates an obviously nonsensical situation. The second is the avoidable malpractices of its members. They do not contribute adequately to its expenses, thereby keeping it financially weak. They do not sufficiently support it except when their interests dictate that they should — like the Egyptians welcoming its stand against Israelis, French and British and ignoring its urgings about the free passage of the Suez Canal to all. They do not act impartially but apply a 'double standard', kicking those who are kickable and bowing respectfully before those who are not. The third factor restricting its development is the unexpected and unusually bad international environment in which it has to function. The founding fathers of the United Nations, we are told, believed that the great of the world would pull amicably together. They never contemplated such abuse of the veto as we have seen. They never imagined a world such as this, torn by the Cold War, upset by the heady surge of nationalism and of anti-colonialism. All three of these things, we are told, are ephemeral, like youth a stuff that will not endure. The unnecessary institutional weaknesses, being unnecessary, can be removed. The avoidable malpractices, being avoidable, can be rectified. The unusually bad international environment, being unusual, can be expected to improve, something which the rectifying of the malpractices and the removing of the weaknesses will themselves ensure.

If these explanations of the present limited influence of the United Nations are correct we can believe that it is indeed pointing the path to the future in which more and more clearly it will emerge as the government of mankind. If, on the contrary, they are not true we will not be able to convince ourselves that we must pin all our hopes for terrestrial salvation on the transformation of the United Nations into the Government of the World.

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We must note, first of all, that these explanations of the present limited influence of the United Nations are not new. All of them were advanced to account for the failure of the League of Nations. The argument of its unnecessary institutional weakness was put forward — if only, it was said, we had not been stupid enough to saddle ourselves with the unanimity rule and wise enough to accept the obligation to submit all our disputes without reservation to it. So was the argument of the avoidable malpractices of its members. The League, like Christianity, we were told, had not failed because, like Christianity, it had never been tried. How different would things have been if only its members had supported it! And there was the argument, too, of the unexpectedly bad international environment in which it had to work. Who, Gilbert Murray asks in his autobiography, could have foreseen such monsters as Hitler and Mussolini against whom the League had no fair chance?

We can see, secondly, that these explanations are not true. What are said to be the unnecessary institutional weaknesses of international organisation are unfortunately not unnecessary as we appreciate as soon as we ask the question 'why are they here?' They are here because this was the price that had to be paid for the setting up of the United Nations. And if this price had not been paid the United Nations would not have been set up. We can recall the statement made to the San Francisco Conference by the U.S. representative: "Your people will acclaim you when you return home and tell them that you have torn up the veto. But what will they say to you when you add that you have torn up the Charter as well?" It should convince us that the alternative to the present United Nations, works and all, is not a United Nations from which all disfigurations have been removed, but no United Nations at all.

What are said to be the avoidable malpractices of its members are unfortunately not avoidable as we appreciate as soon as we ask the question 'why do members act in this way?' They act in this way because this is the way in which sovereign states act. We would think it silly to say to a crocodile 'Be a man and leave these disgusting habits that are fit only for crocodiles.' But it makes no more sense to urge states, which habitually act according to their interests, to act impartially. Still, it may be argued, at least where their own interests are not involved, states may act impartially. But quite apart from the fact that the admission that states will not act impartially where their own interests are involved is itself a great qualification of the proposition that these are avoidable malpractices, do we not know that we were saying 'You scratch my back and I'll scratch your's' when we came out of the trees and that if such wisdom was ever beyond our comprehension we would already be deep in them again? If we doubt it we can recall that it was said of the U.S. delegates to the United Nations who found difficulty one Thanksgiving Day, in drumming up the desired majority that on that day they really began to talk turkey. Once again we must admit that acceptance of these 'malpractices' is part of the price that we go on paying for the United Nations and that there would be no United Nations if that price was not paid.

What is said to be the unusually bad international environment in which it has to operate is unfortunately not unusual as we appreciate as soon as we ask the question 'when has the international environment ever been usual?' It has always been full of

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strain. And to be told that the founding fathers of the United Nations expected that the great powers would habitually agree is to be told what must strain credulity beyond the limit. How well have they ever agreed? How well did they agree when they had in Germany a common enemy to remind them that if they did not hang together they might very well hang separately? And could they have been stupid enough to believe that once that enemy had been removed agreements which have proved so difficult to reach while he existed would become easier? Obviously the very opposite of what we are told in this matter is true. Far from the strong insisting on having the veto in the belief that they would agree they did so in the knowledge that they would not. However much they may have toyed with the idea of rectifying the conduct of the small powers, removing from their hearts all uncharitableness and from their practices all evil, they knew that as far as they themselves were concerned this was a task that must be left to God. For nothing could compel a great power to do what it was determined not to except a greater power that might be thrown against it in war. But because it was the purpose of the United Nations to keep the peace and not to wage war all temptation must be removed from it to contemplate action against the great. And the veto, which did this, at the same time by calling attention to the fact of great powerdom acts as a standing reminder to all of us that tension and strain remain characteristics of the international environment which can therefore never be 'usual' if by that we mean being free of these things.

The true explanation of the limited influence of the United Nations is that it is, as the Charter tells us, an association of sovereign states, for in a world of sovereign states the influence of international organisation will always be limited. This does not mean that it has little to offer us. It provides a place where the world's states can meet and is a useful adjunct to diplomacy more particularly as poorer states which cannot afford the upkeep of many embassies can meet all the world here. It provides a forum in which the opinions of all can be made known, an agency through which important welfare work can be carried out, a helpful means of sorting out certain 'ex-colonial' tangles and of saving face. Not least it can play its part in helping to create the very important sense that there is indeed an international community which it must be the object of all to preserve. This does, however, mean that among the things the United Nations has to offer us 'world government' is not to be numbered. This is not a vision leading us to a better world but a delusion that will destroy us if, like the dog in the fable, it makes us lose what we can have in order to seize what we can not. For as Burke reminded us our situation is not in our control but our conduct in that situation is. Hence we will find it more profitable to seek to understand and take the kind of action that will bring us safety in a world of enormously strong sovereign states which would not hesitate to use their power if their continued existence was threatened than to try to remove them altogether. For if the world is destined to see the disappearance of the sovereign state the manner of its happening, as Sorel would have said, eludes description. To bring that about, as Frederick the Great reminded the ideologues of his day, all that is lacking "is the consent of Europe and a few similar trifles." It is still lacking and we are still unable to attain it.

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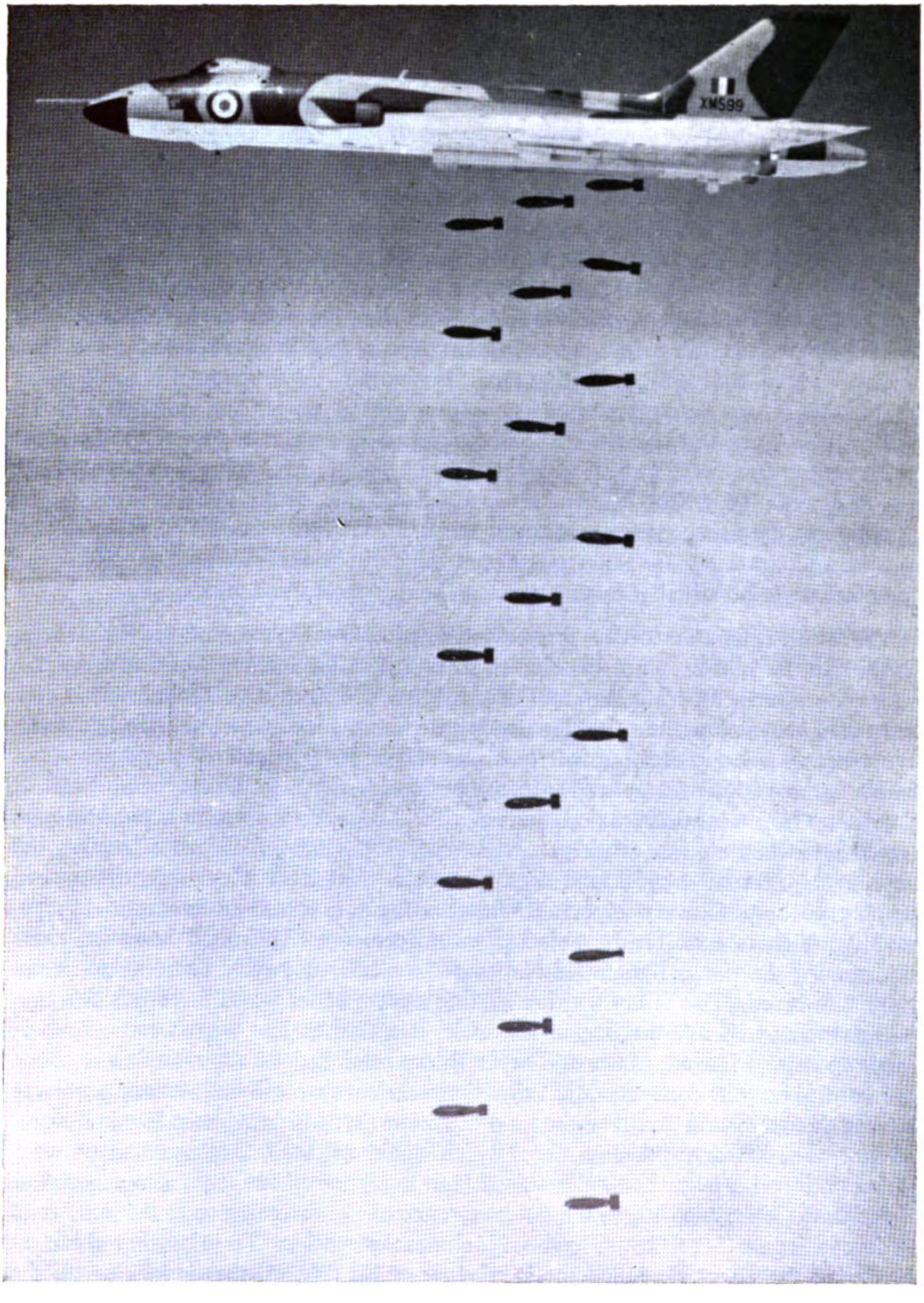

Britain's nuclear deterrent force has also an impressive conventional capability.
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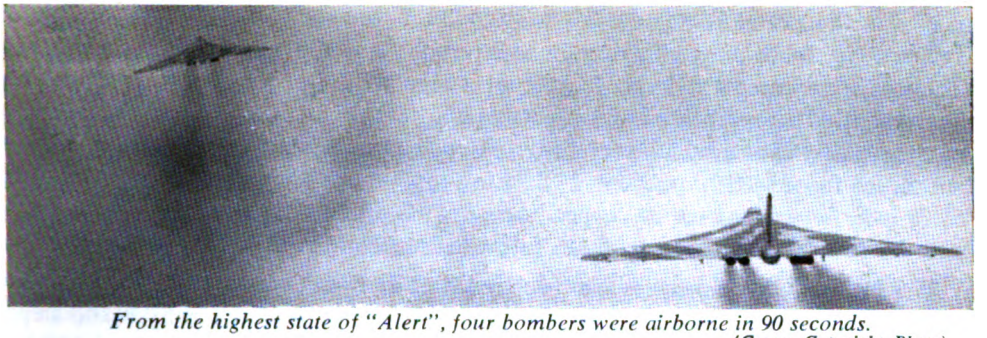

From the highest state of "Alert", four bombers were airborne in 90 seconds.
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ROYAL AIR FORCE BOMBER COMMAND

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THE COMMANDER

Air Chief Marshal Sir Wallace Hart Kyle, G.C.B., C.B.E., D.S.O., D.F.C., Air Officer Commanding-in-Chief, Bomber Command.

Since February 1965, Australian-born Air Chief Marshal Sir Wallace Hart Kyle, G.C.B., C.B.E., D.S.O., D.F.C., has been Air Officer Commanding - in - Chief, Bomber Command. He had previously spent three years at the Ministry of Defence as the Vice-Chief of the Air Staff. Air Chief Marshal Kyle won his D.F.C. when he led No. 139 Squadron of Blenheims against the Ijmuiden steel works in one of the classic low-level attacks of the war. His D.S.O. followed in 1945 in recognition of his many operational sorties. He was appointed A.D.C. to King George VI in 1949, and to the Queen in 1952.

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OVER the years, Royal Air Force Bomber Command has been welded into a military force of an effectiveness and power without parallel in British military history. It represents a large capital investment and has for ten years been the instrument of Britain's nuclear deterrent policy whilst at the same time possessing an impressive conventional capability. At one time expenditure on the deterrent accounted for almost 10 per cent. of Britain's total annual defence budget. However, there is no longer any capital expenditure for the aircraft, equipment, and airfields, and the cost of the "deterrent" has fallen to less than 3% of the defence budget.

The British Government whose declared aim in NATO is to preserve peace by deterring aggression, thus creating conditions for further easing of tension and steps towards disarmament, has proposed an Atlantic Nuclear Force which would be subject to collective authority. The Government has offered to contribute to the ANF the V-bombers (except those required for commitments outside the NATO area) and the British Polaris submarines now under construction. This implies a massive contribution to the Alliance including a hitherto unknown degree of inter-dependence. and would supplement the present availability to NATO of the major part of the Royal Air Force in the United Kingdom and of the Royal Navy, as well as Britain's land air forces in Germany.

Against the background and experience of the strategic offensives of the last war and Britain's pioneer work on developing and flying the first effective jet bomber, the Canberra, the foundations of the present V-force were laid on the Valiants, which discharged Britain's first operational atomic bomb over Maralinga in Australia, in 1956 and the first H-bomb over Christmas Island in the Pacific in 1957. Meanwhile the first of the higher performance Vulcans and Victors were being produced. The Mark I Vulcans began to equip squadrons in 1957 and the more powerful Mark 2's followed in 1960. The last and biggest of the series, the first Victors, became operational in 1958 and the Mark 2's in 1962.

Now the front line is equipped with Mark II Vulcans and Victors whose principal weapon is the Blue Steel stand-off bomb, with a nuclear warhead in the megaton range. It is released from a point miles away from the target at high, medium or low level, thus avoiding the close defences around potential targets.

OFFENSIVE VIABILITY

To remain a viable and credible deterrent force, Bomber Command has had constantly to heed the age-old military truth that defence always tends to catch up with offence, and to review and revise its strategy not only in the light of the advance of methods of air defence but in that of its own aircraft, weapons, and equipment. In its earlier years the V-force had to rely upon its height (in excess of 50,000 feet) and its speed (a point or so short of that of sound) to penetrate enemy air space to points over its targets to drop freefalling nuclear bombs. The development of ground-to-air surface missiles and much more sophisticated ground environments neutralized these advantages.

So followed the development of the Blue Steel stand-off bomb and the devising of new tactics to overcome the more sophisticated air defences. At the same time,

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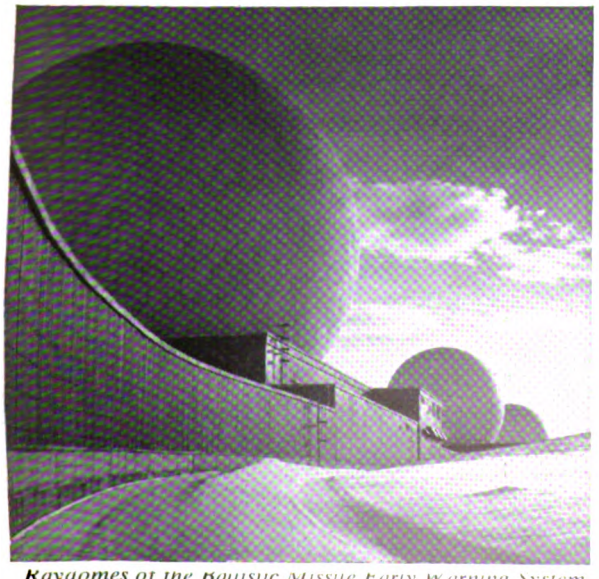
powerful and varied airborne electronic counter-measures devices were developed to jam, confuse and neutralize the early warning radars, the control of fighter interceptors, the detection radars of fighters and the anti-aircraft radars. It has been said that the power of these devices is such that they have never been tried out at one time over the United Kingdom because of the fear that they might cause a total communications black-out. In addition to all these measures, Bomber Command went for the one remaining gap in these defences, the narrow band between the ground and the effective operational level of radar only a few hundred feet above it, giving the aircraft a sustained low level terrain-following capability which is in constant practice under all conditions.

Evasive routing of strike aircraft is another method of ensuring target penetration, and here it is of importance that the range of the V-force confers upon it the ability to penetrate at any point or points between the North Cape and the Black Sea. It could also rely, to a certain extent, upon the fact that the first retaliatory ICBM's from the United States would disrupt the air defence system. The V-bombers could go in high or low and in fact the range of options would pose extremely difficult, if not impossible, problems for the defences. With 70% of the most important targets in Russia within range, including most cities with a population over 100,000, Bomber Command has the capability of devastation on an entirely unacceptable scale.

EARLY WARNING

Prime requisites of a deterrent bomber force are adequate warning of attack by aircraft or missiles and its ability to get airborne to avoid destruction on the ground.

Warning of aircraft attack would reach Bomber Command through the highly efficient early warning radars of the Western Alliance, of which the RAF Fighter Command complex is an integral part. But for warning of the main threat, for intermediate - range ballistic missiles, it relies upon the Ballistic Missile Early Warning System station at Fylingdales, high on the North Yorkshire Moors, whose radars maintain ceaseless watch in the air space over most of the Soviet and satellite land mass from which such an attack would be most likely to be launched.



Kayaomes of the Ballistic Missile Early Warning System, at Fylingdales, Yorkshire.

Before Fylingdales went "on the air" in September, 1963, the UK had to rely upon missile warning from North

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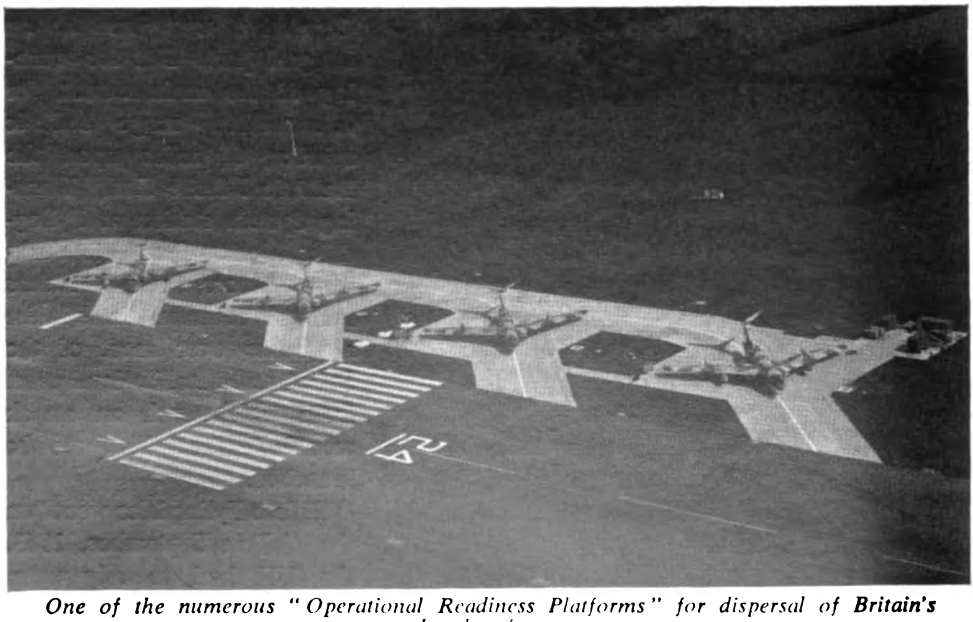
America generated by the earlier BMEWS sites at Thule (Greenland) and Clear (Alaska). The three sites together maintain their vigil to detect launching of both ICBMs and IRBMs, but it is Fylingdales which would give first notice of those directed at Western Europe and perhaps of those against the North American Continent. By this means Bomber Command, all SACEUR's forces, and the retaliatory forces of the United States, would be alerted. Information from all three BMEWS stations is fed instantaneously into North American Air Defence Command Headquarters at Colorado Springs, and the three stations share their information.

Fylingdales' remarkable reliability record — 99.99 per cent. with some periods of months of never being off the air for a single second — is a tribute to Anglo-American co-operation. Equally dependable have been its multiple communications links with Fighter and Bomber Commands, NORAD and the other sites.

Through Fylingdales, Bomber Command is assured of a minimum warning of four minutes of the launching of ballistic missiles, but the probability is that it will be twice that time.

THE ALERT STATE

From the earliest days of the V-force, Bomber Command realised the necessity for a "scramble" capability to ensure the survival of the aircraft. This ability was aptly demonstrated during the 1960 Farnborough Air Show when every day for a week the crowds witnessed four V-bombers getting off the ground in little over 100 seconds. Since then the technique has been progressively improved and constantly practised by all Bomber Command aircraft, with the result that valuable seconds are still being knocked off the "scramble" times.



One of the numerous "Operational Readiness Platforms" for dispersal of ***Britain's*** *bomber force.*

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Apart from the obvious vulnerability to attack of several squadrons on one bomber base, there was the need to get the whole force airborne quickly. So the dispersal scheme came into being. This involved the preparation of facilities at a large number of airfields throughout the length and breadth of Britain, so that in times of tension the aircraft could be dispersed, not more than four to a base. "Operational Readiness Platforms" — hard-standings for four bombers, leading on to the main runway at an angle — were constructed at the bases and the dispersal fields. There the aircrews stand by in special accommodation, close to the aircraft. At the highest state of alert the crews are in the aircraft, all equipment is checked and the aircraft are ready to go on a signal from the Operations Controller at Headquarters Bomber Command, whose voice is heard in every cockpit. It is from this state that the detachments of four can all be airborne in 90 seconds or so. Lesser states of alert affecting different proportions of the force can, of course, be applied. "No notice" alert exercises can be called by the Commander in Chief at any time of the day or night. Apart from their training value, they provide a constant check on the state of the Command's readiness.

THE RECONNAISSANCE FORCE

With its new Mark 2 Victors converted to the strategic reconnaissance role, Bomber Command has an aircraft with performance in terms of range, speed, height and operational effectiveness, far in excess of the Valiant it replaced. The Victors are equipped for reconnaissance regardless of darkness or cloud cover. Using X-band radar, four Victors could cover the whole of the Atlantic in less than six hours, and on a single sortie could produce radar photographs for a mosaic of the whole of the Mediterranean which would enable a count of every ship to be made. Q-band radar gives high definition at shorter ranges and allows, for example, an airfield to be photographed in darkness or through cloud cover to reveal aircraft, runways, hard standings, hangars and vehicles in great detail. The force also uses the latest developments in photographic reconnaissance equipment. Canberras are still widely used for reconnaissance tasks and a detachment has only recently returned from a survey in the Caribbean area.

CONVENTIONAL OPERATIONS

In addition to its major deterrent role, the V-force is equipped and trained to play an important part in the event of limited war. A conventional capability was built into all the V-bombers in the design stage though currently the Vulcan is the only aircraft employed in this rôle. With its long range and 21 one thousand pound high explosive bombs, backed by a comprehensive fit of electronic counter measures, the Vulcan is a most effective conventional bomber aircraft. To ensure the efficient operation of the force in a limited war situation, squadrons are regularly detached to various overseas theatres to carry out conventional training in the operating environment. With the confrontation between Malaysia and Indonesia, Bomber Command has maintained a detachment in the Far East for over two years. Recently Vulcans from this detachment flew to Australia to take part in air defence exercises

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with the Royal Australian Air Force. Great emphasis is placed on the ability to provide the necessary reinforcements rapidly and as a result the rapid deployment of Vulcans from the UK, backed by Comets and Britannias of Transport Command, is now frequently exercised.

Apart from the tasks of overseas reinforcement there are constant overseas missions enabling the air and ground crews to operate in areas and environments very different from that of their permanent home bases. These range over both hemispheres and may take the form of "showing the flag" flights or participation in air displays throughout the British Commonwealth, the American continent or in any of the NATO or CENTO countries. The most recent have been the visit of Vulcans and Victors to Tehran for the Iranian Air Force Open Day and the flight to New Zealand by two Vulcans for the opening of the Auckland International Airport at Mangere. Victors of No. 139 Squadron will be visiting Jamaica for the Commonwealth Games in August 1966.

FLIGHT REFUELLING

The primary flght refuelling rôle of the Command is in support of Fighter Command's overseas reinforcement commitments, though the tankers provide added mobility and flexibility to the bomber force. The new long range transport aircraft, soon to be entering the RAF, are designed with a flight refuelling capability so that it is possible that the tanker force could have many varied tasks in the future.

The Victors were intended to supersede the Valiants during 1966/67 but owing to the sudden withdrawal of the Valiant from service in the early part of 1965, plans were made to introduce the Victor much sooner. As an interim measure the first Victor tanker squadron was equipped with aircraft designed for two point refuelling only. The first tanker was delivered to No. 55 Squadron in May 1965, months ahead of schedule, after the manufacturers had modified the existing bomber aircraft by fitting extra fuel tanks in the bomb bays and two refuelling pods, each containing a refuelling hose, drogue and trailing mechanism, under the wings. These aircraft are capable of refuelling two fighters at once while flying at a wide range of heights and speeds.

The three point tankers entered service in January, 1966, and the build up of aircraft will continue until the third squadron is completed in the early part of 1967. Apart from being able to refuel other V-bombers through a refuelling hose in the lower rear fuselage, these three point Victors will be able to refuel three fighters simultaneously.

Air-refuelled by Victor tankers, Lightning fighters can fly to the Near East in 4½ hours. Similarly a V-bomber can fly to the Far East in 15 hours — less than half the time it would take with normal ground refuelling.

Air-refuelling procedure is by the probe-and-drogue method. The Victor trails a hose terminating in a reception coupling and drogue. The fighter has a nozzle fitted to a probe mounted on the nose or wing leading edge. To make contact, the fighter merely flies his probe nozzle into the conical drogue while overtaking the Victor at two to five knots.

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The nozzle automatically opens its valve and that in the reception coupling, thus enabling fuel to pass between the two aircraft. On completion of refuelling, the fighter pilot has only to close his throttles slightly and drop back until the probe nozzle is pulled out of the reception coupling.

The Valiant tankers were instrumental in the making of some remarkable long-distance non-stop flights by Bomber and Fighter Commands. In June, 1961, a Vulcan made the first non-stop flight from the United Kingdom to Australia, covering the 11,500 miles to Sydney in 20 hrs. 3 mins. at an average speed of 575 mph. Other non-stop flights have been made to Cape Town (Valiant, 6,060 miles, in 11 hrs. 28 mins. at 529 mph, July 1959) and to Singapore (Valiant, 8,110 miles in 15 hrs. 35 mins. at 523 mph, May 1960).

THE AVRO VULCAN

The Vulcan, which first flew on 30th August, 1952, was the world's first large delta-wing bomber, a configuration chosen because of its unique combination of load carrying capabilities, high subsonic speed at great height and long range. It carries a crew of five — the captain, co-pilot, navigator/plotter, navigator/radar and air electronics officer — and became operational with No. 83 Squadron, Waddington, in July, 1957. The B Mk. 1 has four Bristol Siddeley Olympus turbojets each developing 13,500 lb. thrust. The Vulcan B Mk. 2, developed with more powerful Olympus engines, increased span and an extended and bulged tail-cone to house electronic equipment, entered service in 1962. This version can carry the Blue Steel stand-off bomb.

Many overseas goodwill and training flights have been made by Vulcans, including visits to such countries as Brazil and Argentina and non-stop trips to Central Africa and Australia with the aid of in-flight refuelling. There have also been numerous flights for air displays ranging between Paris, Toronto, Alaska and the Philippines and special missions to Kenya for the opening of the Nairobi Airport; to Australia for the Commonwealth Games, and the recent visit to New Zealand for the opening of the Auckland International Airport.

The B Mk. 1 has a span of 99 ft.; length 97 ft. 1 in.; height 26 ft. 6 in. The B Mk. 2 has a span of 111 ft.; length 99 ft. 11 in.; height 27 ft. 1 in.

THE HANDLEY PAGE VICTOR

The third and last of the V-bombers ordered, the Handley Page Victor is also the biggest and heaviest. Identifiable by its crescent-shaped wing, the B Mk. 1 went into squadron service with Bomber Command in the Spring of 1958, and the B Mk. 2 in February 1962. The configuration keeps the critical Mach number constant along the span by graduating the thickness ratio and sweepback towards the tips. This gives low drag at high speed, good stability and control at low speeds, and results in optimum performance at the maximum loaded weight. It carries the same crew as the Vulcan. The Victor B Mk. 1 is powered by four Bristol Siddeley Sapphire turbojets, and B Mk. 2 by four Rolls-Royce Conway turbojets. Fast times

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on routine training flights include Farnborough to Malta in 2 hrs. at 655 mph; across the Atlantic from the Labrador Coast to the Irish Coast (2,020 miles) in 3 hrs. 8 min., and Cottesmore to Akrotiri, Cyprus (2,200 miles) in 3 hrs. 46 mins.

The span of the B Mk. 2 is 120 ft. (B Mk. 1: 110 ft.); length 114 ft. 11 in.; height 28 ft. 1½ in.

BLUE STEEL

Blue Steel, stand-off air to surface weapon designed as standard armament for the Mark 2 versions of the Vulcan and Victor, enables targets to be attacked from outside the range of local defences. It can be released at high or low level and has exceeded its specification in range, accuracy and reliability. Its nuclear warhead is in the megaton range.

The missile has a rocket engine using liquid propellant, and is guided to its target by an automatic built-in navigation system. Directional control of the missile is on the "twist and steer" principle, in which each turn is begun by rolling with the ailerons, and is then maintained by increasing lift on the foreplanes. The advantages of this type of configuration are clean aerodynamic lines (which give reduced drag under cruising conditions), simplified control arrangements and a convenient layout for the internal equipment.

At the moment of release — well outside the enemy's defence zone — the missile's computer (which already "knows" the target location) is automatically given the exact position from which it is starting, its speed and the direction in which it is heading.

Blue Steel falls freely at first and then, after a few seconds for safety, the motor fires and the missile accelerates and begins to climb. It is now under the command of its inertial navigator, which computes every change of velocity and direction from ultra-sensitive acceleration measurements made within the missile, with reference to the position at which it left the carrier. Requiring no signals from outside, it cannot be jammed or diverted by counter-measures during flight.

HISTORICAL NOTE

Thirty years ago—on July 14, 1936—R.A.F. Bomber Command was formed at Uxbridge following the reorganisation of Britain's home defence forces.

Early bombers such as the Hawker Hind, Hawker Audax and Boulton Paul Overstrand were replaced by the more sophisticated Fairey Battle, Bristol Blenheim, Vickers Wellesley and Wellington and these in turn were succeeded by the four-engined Stirling, Lancaster, Halifax and Lincoln.

During the war Bomber Command dropped just under a million tons of bombs — today this is only the equivalent of a single nuclear weapon.

Editor.

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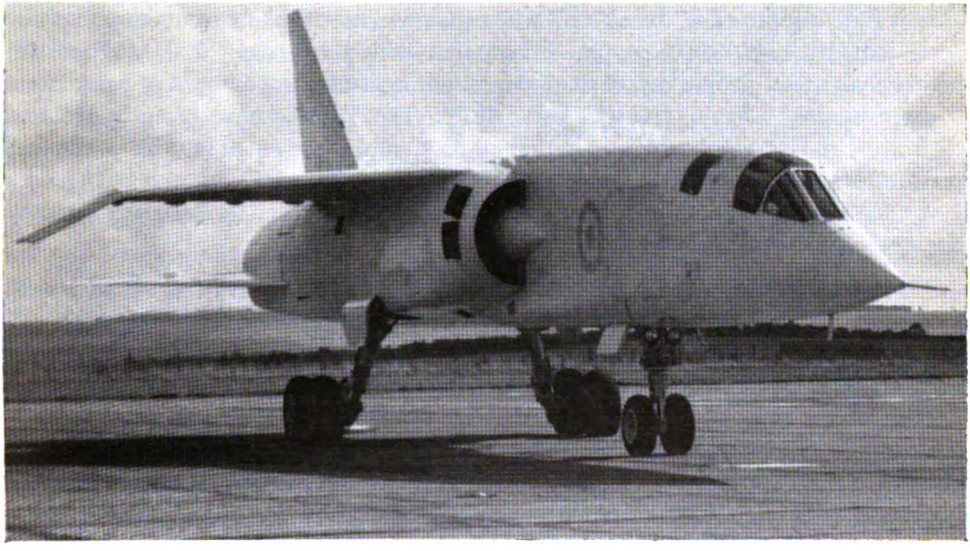
R.A.F. OR U.S.S.A.F.?

By John W. R. Taylor, F.R.Hist.S., A.R.Ae.S.

WHEN the history of our time is written by 21st century authors, the 1966 *White Paper on Defence* may well be described as second only to its 1957 predecessor in its disastrous effect on Britain's security and status. The main difference between the defence policies of successive governments is that, whereas the Conservatives had no consistent programme at all, the Socialists have at least announced some kind of programme, however ill-conceived it may be.



The TSR.2 — most brilliantly conceived military aircraft of the sixties.
(British Aircraft Corporation Photo)

Many readers of this journal may not agree that the present programme is ill-conceived. Already, there seems to be a general acceptance of the government's suggestion that Britain could not have afforded the TSR.2 — the most brilliant and promising military aircraft of the 'sixties. It is easy to be thankful for the fact that we are last buying some new types of combat aircraft for the Royal Air Force, without too much regard for where they come from or whether they will do the job. Some protagonists of land-based air power even derive malicious delight from the "fact" that the R.A.F. has scored over the Navy, whose projected new aircraft carrier must remain still-born to pay for the aircraft being bought from America for the R.A.F. This is rather like buying a single foreign-made lock for the front door of one's house, at a cost of £2, rather than two British locks for the front *and* back doors, at a price of £1 each.

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But, wait a minute — has it not been said that the R.A.F.'s "British lock", in the shape of the TSR.2, would have cost £9 million, against a mere £2.5 million for the American F-111A which is now to be purchased? With no lack of respect, it is difficult to believe that even Messrs. Fred Mulley, Healey and Wilson really regard these figures as being strictly comparable. They were put out in a period of pre-election juggling with statistics and it would be more logical to add on to the F-111A's £2.5 million the proportion of the TSR.2's £9 million (or less) which has already been spent and, therefore, thrown away with no ironmongery to show for it. That would be, after all, the true unit cost of the R.A.F.'s new strike aircraft. Or would it? There are many who regard the break-up of the British aircraft industry as being the greatest price paid for the F-111A, Phantom, C-130 Hercules and other purchases from America.

Is it fair to write of a "break-up" when the government plans to maintain an aircraft industry of 200,000 people — compared with the present 250,000, but still higher than many people regard as the optimum figure for the amount of work likely to be available? Again, statistics mean little. The Chinese have recently declared their army to be truly democratic in that all its members are equal in rank — whether privates or generals is immaterial. The British aircraft industry may well end up with 200,000 "privates", in the form of production workers, after its designers and top engineers have found other jobs.

Those readers with slightly longer memories than any government would wish us to have may recall that it was the intention that designers " released " from the too-great demands of the TSR.2 programme would switch to other industries hotly engaged in Britain's export drive. Unfortunately, men whose life's work has been devoted to making this country supreme in the air, and safe, do not take kindly to the thought of designing washing machines and perambulators. Many have gone aboard to work for aircraft companies such as VFW in Germany — but, apparently, not so many as might have been expected, despite the attraction of high salaries.

Mr. Mulley has said, encouragingly, that "Some very wild statements have been made about the alleged mass exodus. Of some 500 design staff at Weybridge who left since TSR.2 was cancelled, about 50 are belived to have gone abroad, rather fewer than 30 to the United States." But Mr. Mulley does not seem to have heard of people like Comprehensive Designers Inc. This is an American organisation which employs British designers to work on American projects *in the U.K.*, at salaries 40% higher than those paid by British companies. Even such salaries are lower than the U.S. employers would have to pay if the men worked in America, and the designers can continue living in their own homes without all the disruption of moving across the Atlantic to a completely different environment.

In one recent month alone, no fewer than 50 top Hawker Siddeley and British Aircraft Corporation designers joined Comprehensive Designers Inc. These, and their colleagues in this concern, and those who went earlier to Canada, the U.S.A., Holland, Germany, South Africa and elsewhere, must be added to Mr. Mulley's figure of "about 50". Bearing in mind the comparatively small number of people employed

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on design work by the British aircraft industry, the 'brain drain' is not merely worrying, it is utterly disastrous.

There are other aspects of present government policy equally deserving of comment and study. For example, the abandonment of carriers seems crazy in view of their proven value in campaigns such as the Korean War, Suez, Vietnam and even against Mr. Ian Smith's oil. This type of operation is far more likely in future than an all-out nuclear war and it will be interesting to know how we can plan to meet all our world-wide commitments with 50 F-111A's, especially after we have vacated still more of our former network of strategically-sited bases such as Aden, Singapore and — who knows? — Gibraltar.

One could also debate at length the economic disadvantages of buying for dollars aeroplanes that we could have built for Sterling, or of keeping American aircraft workers in employment at the expense of our own industry. Space does not permit the development of such themes; but there are some aspects of the present situation that are of vital interest and importance to readers of the *Royal Air Forces Quarterly*.

The first is posed by the title to this article, which asks whether Britain is to have a Royal Air Force or a United States Satellite Air Force in the future? This may seem a rather silly question when we are simply buying a number of very good aeroplanes from America until — so we are told — we can replace them with advanced* combat aircraft designed and built in collaboration with our friends in France. Unfortunately, as any senior air force officer knows, it is often as difficult to keep first-line aircraft operational as to get them in the first place.

Take Indonesia as an example. That country received from the United States ten C-130B Hercules transport aircraft. Because its politics now clash with those of America, it can get no spares for these aircraft and they are grounded. So, unless our government follows politically in the footsteps of its transatlantic counterpart — rather like Good King Wenceslas and his page — we may have in Britain one of the finest air forces in the world — "in Britain" more or less permanently because through lack of spares, it cannot be flown to anywhere else. Hence the allusion to a U.S. Satellite Air Force.

Let us assume, however, that we shall have all the American-built aircraft to which we are becoming committed and that our government never again offends America by mounting an operation like the Suez campaign. In that case, provided we can still afford some fuel after paying for the aircraft, will they be good enough to enable the R.A.F. to meet all its commitments?

At the moment it is not clear what these commitments might be in a few years time. However, as has been stated already, the most likely situations demanding our military intervention will be campaigns on the lines of those in Malay, Korea, Kenya and Vietnam. To meet this requirement, the R.A.F. planned some years ago to create a "go-anywhere" air force that would be the envy of the world. Basis of the force was to be a hard-hitting nucleus of TSR.2 tactical reconnaissance-bombers, backed up by P.1154 strike fighters and supported by HS 681 transports — all three types having

* and, apparently, inexpensive; though one wonders how this can be achieved

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either STOL (short take-off and landing) or VTOL (vertical take-off and landing) capability. Loss of overseas bases would have been of less concern if the R.A.F. had had such aircraft — but we were told they were too costly. So, what do we intend to have now in their place?

To start with, it was no use trying to replace them with VTOL and STOL combat aircraft bought overseas, as no such machines exist. So, instead of being able to look forward to a period when it would be uniquely formidable and ubiquitous, the R.A.F. is now faced with the prospect of becoming a small-scale carbon copy of parts of the U.S.A.F. No one doubts that it will make the best of a bad job, by making up some of the deficiency with its traditional inspired leadership, brilliant flying standards and first-class maintenance standards; but will it be able to do its job fully?

The concept of the TSR.2 and P.1154 resulted from the need to operate in areas where large prepared bases might be few or even non-existent. By making the TSR.2 capable of penetrating hostile territory at supersonic speed below 500 feet, it was hoped to ensure operational effectiveness in those parts of the world protected by highly-efficient surface-to-air missiles such as the Soviet "Guideline", by speeding in "under the radar". The aircraft was packed full of electronic equipment for the vitally-important reconnaissance rôle and for its own defence through countermeasures systems.

Security regulations forbid any precise discussion of the capabilities of the cancelled aircraft, but even their harshest critics have claimed only that they would have been too costly, not that they would have failed to fulfil their ambitious and still-unrivalled specifications. How far will the F-111A, Phantom and Hercules go toward meeting the same requirements?

As a start, none of them is a VTOL or even STOL type; so we can forget the possibility of operating from jungle clearings, 500-yard strips hacked out of the bush, or anything of the sort. If, after accepting this limitation, and without the off-shore support of aircraft carriers in the '70's, it is still worth having an air force, then these three American aircraft are as good as anything we could buy overseas.

Within its specification, the F-111A is a very remarkable aircraft. Initially, only two versions were planned: the F-111A tactical fighter-bomber for the U.S.A.F., with an offensive load of up to fifty 750 lb. conventional bombs, and the F-111B for the U.S. Navy, with a primary armament of eight Hughes Phoenix air-to-air missiles. Almost the only external difference between these versions are in the nose shape, caused by different radars, and in the addition of "bolt-on" wingtip extensions on the F-111B to provide additional wing area for operation from carriers.

On December 3, 1965, the U.S. Secretary of Defense, Robert McNamara, announced that more than $12 million had been authorised to develop a reconnaissance version, the RF-111A. One week later, he announced plans for a fleet of 210 FB-111 strategic bombers to replace the older types of B-52 Stratofortress and B-58 bombers in service with Strategic Air Command. Thus, already, the F-111 is growing into quite a versatile family of combat aircraft.

When adopted after the war, the "F for Fighter" designation could hardly have been expected to apply one day to such aircraft, with an all-up weight of more than

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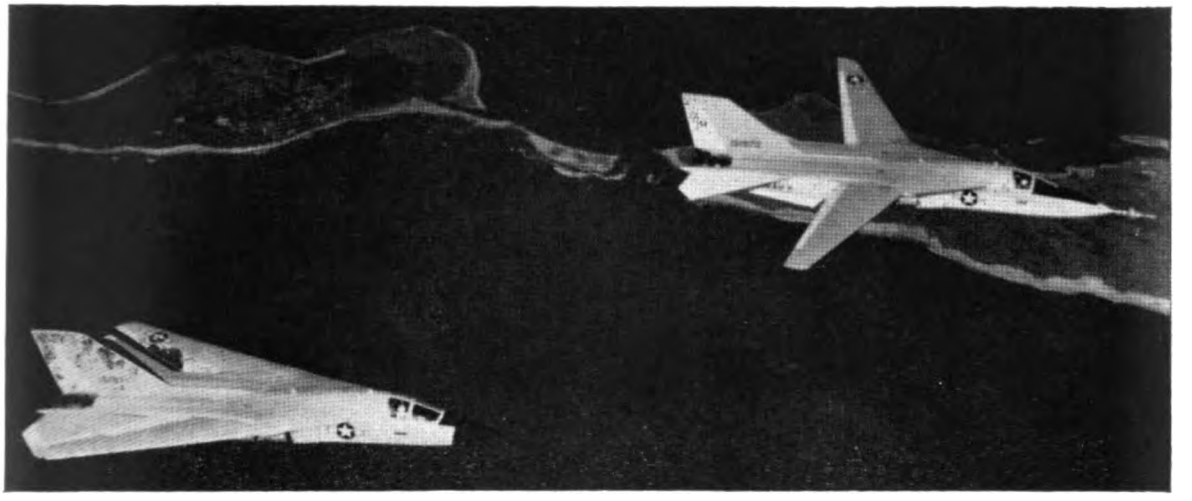

Two F-111 aircraft illustrating the two extremes possible with the variable-sweepwing.

70,000 lb., bomb-load of up to 18¾ short tons and cost of £2.5 million. In fact, of course, the U.S.A.F., R.A.F. and Royal Australian Air Force all plan to operate the F-111A as a bomber rather than as a fighter, with announced orders for 425, 50 and 18 respectively. The U.S. Navy has, so far, ordered only 29 F-111B's, pending the results of a weight-saving campaign to bring the aircraft down to what is considered the limit for operation from carriers and completion of flight tests. Both versions are two-seaters, powered by two Pratt & Whitney TF30-P-1 turbofans, each giving 19,000 lb. thrust with reheat.

In almost every respect the F-111 is a unique aircraft—more so now that the TSR.2 is dead. As a start, of course, it is the first operational aircraft with a variable-geometry wing, known popularly as a "swing-wing". This is intended to enable the F-111A to take off and land in something under 1,000 yards with the wings spread, and to fly at Mach 2.5 at high altitudes, with the wings fully swept to 72.5 degrees. Maximum designed speed 'on the deck' is Mach 1.2. The aircraft had yet to demonstrate supersonic performance at sea level at the time of writing, but had clocked Mach 1.3 at 10,000 ft. and had made a low-level penetration flight of 1,200 miles at subsonic speed. In the latter flight, about half of the time was spent in automatic mode, with the F-111A's terrain-following radar maintaining a 1,000-ft. clearance above uneven terrain that varied from 500 ft. to more than 10,000 ft. above sea level.

Throughout this low-level flight, the F-111A's wings were swept at 26 degrees. This is the maximum possible angle of sweep when carrying a full load of twenty-six British 1,000-lb. bombs, using triple racks on eight underwing pylons and with two bombs in the internal weapon bay. If the sweepback is increased to 54 degrees, for higher cruising speed, 18 bombs can be carried; at full sweep the total is further reduced to ten. Ferry range of the aircraft, without external stores of any kind, is 3,800 miles.

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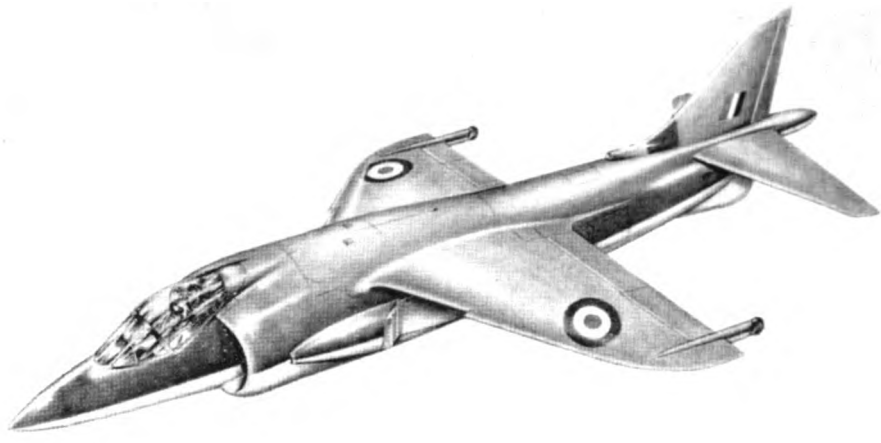

Hawker Siddeley P.1127 "Kestrel" close support strike reconnaissance aircraft, referred to in the Defence White Paper.

(Hawker Siddeley Photo)

By March 25, 1966, the first ten F-111A's had logged a total of 635 flying hours in 400 flights, including 146 flights at supersonic speed. The first three F-111B's had by then flown 87 hours in 65 flights. A great deal of development remained to be done. In particular, the engine installation was being revised at that time, to match the compressors of the turbofan engines with the hydro-mechanical air intakes, and to get the exhaust nozzles right. There have been reports of excess drag; but General Dynamics are confident that they will cure all problems in time to meet their planned delivery date of January, 1967, for the first production aircraft. All 50 R.A.F. machines are scheduled for delivery by January, 1970.

The McDonnell Phantom II — of which about 150 are on order for the R.A.F. and 70 for the Royal Navy — is already well-proven in action in Vietnam; but the British versions will, of course, differ in having Rolls-Royce Spey turbofan engines. These should give a general improvement in performance, particularly at take-off; but the Phantom will remain a sophisticated aircraft, needing a sophisticated environment in which to operate. The U.S. Navy's standard F-4B version, carrying a crew of two and maximum of 13,320 lb of bombs and missiles, has a loaded weight of 54,600 lb. Maximum speed is Mach 2.4 and maximum range about 2,300 miles with external tanks. Clearly one could hardly expect to have STOL capability combined with such performance in a basically-conventional aeroplane, and this must limit the usefulness of the Phantom so far as the R.A.F. is concerned. It is, nevertheless, a most formidable fighting machine, incomparably better than the Starfighters with which most of our NATO partners in Europe are equipped.

The Royal Navy Phantoms will replace Sea Vixens in the all-weather fighter role. R.A.F. Phantoms will initially replace Hunters for ground attack and army support duties, in conjunction with a smaller number of Hawker Siddeley Kestrel VTOL

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fighters of British design (the unrivalled ubiquity of the Kestrels being largely wasted now that we shall have no STOL transport like the HS 681 with which to support them). More surprising is that Phantoms will also replace Fighter Command's Lightnings eventually. Having just persuaded the Saudi Arabians to buy Lightnings, and so earning our aircraft industry its biggest-ever export order, it seems strange to announce that we intend to swop our own Lightnings for American fighters. The ways of government are indeed devious.

There is little need to say much about the Lockheed C-130K Hercules, of which 66 are to be bought as replacements for the Beverley and Hastings and "to make good shortcomings in the performance of the Belfast." The basic design of the Hercules is now 15 years old, so both the aircraft and its 4,200 s.h.p. Allison T56 turboprops are well proven in many years of service. More than 800 have been built for a variety of duties. Maximum payload is 45,000 lb., with which the Hercules will take off in 3,580 ft., cruise for some 2,300 miles at 340 m.p.h. and land in 2,130 ft.

Cost of the programme for purchasing these three types of U.S. aircraft, and for research and development, spares and replacements over a ten-year period, is astronomical. The F-111A's will cost £240 million in dollars and £40 million in Sterling, representing an overall cost of £5.6 million per aircraft for the period. Comparable cost figure for the Phantoms is £590 million, of which some 47% may be payable in Sterling as a result of producing components in the U.K. The C-130's will cost £210 million over ten years, again with nearly 50% of the expenditure in Sterling. Total cost of the programme is, therefore, £1,080 million, with the prospect of further orders to follow. It is interesting to recall that the estimated cost of the "too-expensive" British TSR.2, P.1154 and HS 681 programmes was £1,240 million — all payable in Sterling in the U.K.

It is, of course, possible to juggle with figures to prove almost anything, and different interested parties would be able to show that any sets of figures like those quoted above do not represent all the facts. However, it is difficult to see how the government can really justify the claim that its revised aircraft programme will effect a saving of £1,200 million.

Will the British aircraft industry ever again become the primary supplier of military aircraft to the Royal Air Force? According to the 1966 *White Paper* the answer is "Yes", with the Anglo-French variable-geometry strike fighter and Jaguar dual-purpose trainer/strike fighter scheduled for major roles in the next re-equipment programme in the 'seventies.

Basically, this is good news, but the French aircraft industry can be excused for having certain misgivings, as the swing-wing fighter is not expected to enter service until 1975. Britain's defence plans have undergone repeated major changes in the nine years since the infamous *White Paper* of 1957 was published. Is our latest defence plan any more likely to survive the next nine years of political comings and goings? If not, these brave Anglo-French projects may well go the way of the Blue Streak missile, TSR.2, P.1154, HS 681 and the endless succession of other promising programmes for which the British taxpayer has footed the bill with no very obvious return.

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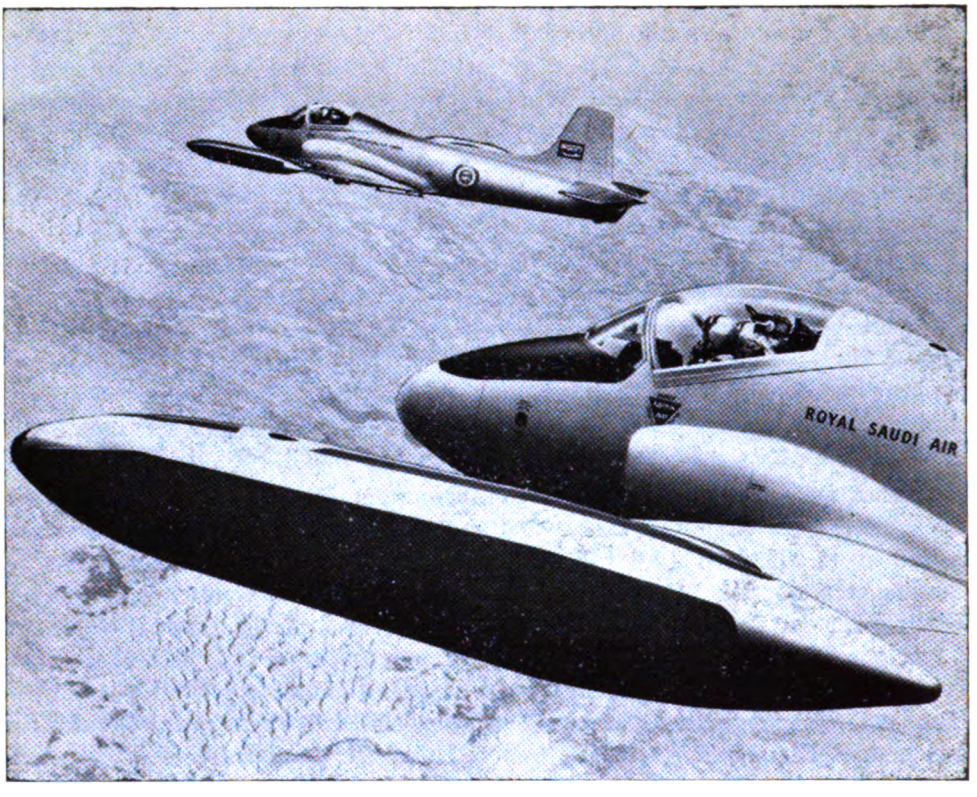

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The BAC 167's blend of power and performance with strength and reliability makes it the most thoroughbred of all trainer-strike aircraft.

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ROYAL AIR FORCE COLLEGE CRANWELL - 1966

By Air Commodore Neil Cameron, D.S.O., D.F.C.

"The old order changeth"

ON the 4th October, 1965, No. 93 Entry reported at Cranwell, including in its number twenty-four technical cadets. By January, 1966, the move of the Technical College from Henlow to Cranwell had been completed, and thus the R.A.F. College has been transformed from a somewhat limited cadet training establishment to an organisation which by its mission and charter, and the intellectual capability and qualifications of its staff and student body, must become a dynamic factor in shaping the whole future of the Royal Air Force.

HISTORY

It really started in 1958 with the Marson Committee whose terms of reference were "to assess the long-term domestic and education accommodation requirements of the Technical College, Henlow, to enable it to fulfil its role of training permanent Technical officers of the R.A.F. and to make recommendations on cost for improvements, additions or extensions to existing facilities". Marson eventually recommended a complete reorganisation and development at Henlow which would have cost one and a half million pounds; a lot of money but reasonable when it is remembered that the R.A.F. Technical College originally replaced at Henlow the School of Aeronautical Engineering which was formed in 1924 and that many of the College technical buildings were of 1914 - 1918 vintage. One of the members of the Marson Committee reserved his position on the recommendations of the report. He was Mr. C. R.

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English, then Chief Inspector for Further Education from the Ministry of Education. It was his firm opinion that the Henlow site did not justify redevelopment and the expenditure of large sums of money, and he suggested the possibility of building a new technical establishment at Cranwell as part of the existing College. He reasoned that putting the two Colleges together as an entity could lead to substantial savings in laboratories and classrooms, and give the Royal Air Force a "University" at which work at both undergraduate and post-graduate levels would be undertaken and where the educational opportunities for both GD and Technical cadets would be substantially improved. An extremely sound and far-sighted appreciation in the Trenchard vein from someone not too closely connected with our Service.

This concept met much opposition, but in November, 1959, the Air Officers Commanding-in-Chief Flying and Technical Training Commands, at that time Air Marshal Sir Hugh Constantine and Air Marshal Sir Wallace Kyle, met and agreed on the importance to the future of the Service of bringing about an amalgamation of Cranwell and Henlow. It was rightly considered that the General Duties and Technical branches were predominant in the Royal Air Force and accordingly they should have the closest possible association. The two Commanders considered that each branch should have "a clear understanding of, and a healthy respect for the role and responsibilities of the other, and that the education and training of officers should be directed towards this end". Since this joint declaration, which was accepted by the Air Council of the day, there have been many Working Parties and Committees to iron out the syllabus, building programmes and administrative details, but the principle of amalgamation remained, though for one reason or another it has taken some six years to achieve.

THE TWO MAJOR BRANCHES

The increasing degree of specialization required of Royal Air Force officers post-war led to the formation of several new branches; but only in the principal executive branches was it possible to provide cadet entry terms and the pattern since 1949 has been for the Equipment, Secretarial and Royal Air Force Regiment cadets to train alongside their GD counterparts at Cranwell whilst the Technical cadets have passed through Henlow. The merger of the two Colleges has ensured that cadets of the two major branches — GD and Technical — will learn, from their earliest days in the Service, the common responsibilities required of all officers, coupled with a working and appreciative knowledge of their respective specializations.

Also, of course, the increasing cost and complexity of modern aircraft and the high serviceability and utilization required if aircraft are to pay their way, has made it essential that the General Duties and Technical branches work together, knowing and appreciating each others problems. Personal relationships at all levels must play a vital part in this liaison, and by educating GD and Technical officers together at Cranwell, close personal relationships should be achieved. Living in the same mess, members of a common college society, playing in the same sports teams and taking part in expeditions will all help to establish these relationships.

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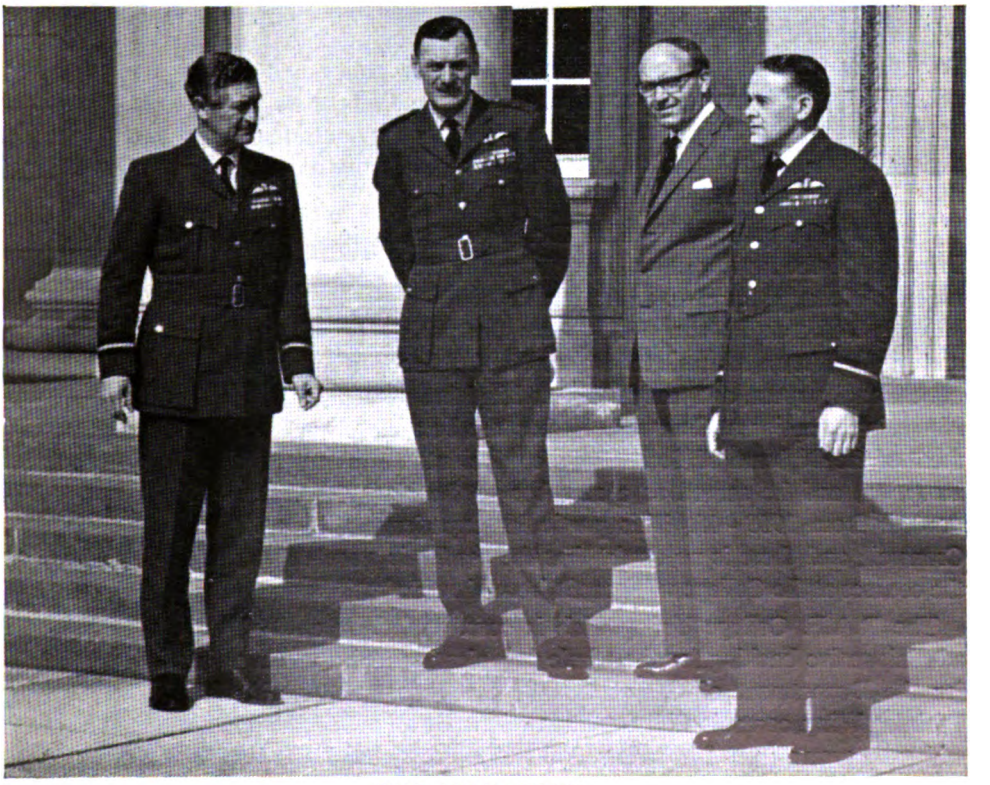
One of the most important aspects of the merger is that the GD cadet will now do his training close to a technical environment and the technical cadet close to a flying environment. The GD cadet carries out his aerodynamics, thermodynamics and any other technical study under the auspices of Cranwell's new Department of Engineering, whilst the Technical cadet studies air operations past and future and flies the Jet Provost if his medical category allows it. Three years training in this sort of cross-branch activity must have the desired effect.

THE HIERARCHY

The new-style College will remain part of Flying Training Command and the Air Officer Commanding-in-Chief, Air Marshal Sir Patrick Dunn, has assumed the responsibility for the technical aspects as well as other training responsibilities. The College, which has the overall status of a Group, is commanded by Air Vice-Marshal I. D. N. Lawson as Air Officer Commanding and Commandant.

The new Department of Cadets is headed by the author and the new Department of Engineering by Air Commodore J. S. Rowlands. These two Departments combine



THE HIERARCHY

Left, Air Commodore N. Cameron, D.S.O., D.F.C., Air Vice-Marshal I. D. N. Lawson, C.B., C.B.E., D.F.C., Dr. G. Tolley, M.Sc., F.R.I.C., Air Commodore J. S. Rowlands, G.C., O.B.E., B.Sc.

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all the features of the old style Cranwell and Henlow except that the Technical cadets now come under the jurisdiction of the Department of Cadets for their first three years of R.A.F. life although they are given their specialist training in the Department of Engineering. The extent to which the College is now an integrated unit is further highlighted by the fact that the technical officer students receive their instruction in basic academic subjects in the tutorial wing which is part of the Department of Cadets.

The cadet course, regardless of branch, still lasts for three years, but on Graduation and commissioning the Technical cadets continue under training for a further one year and eight months to complete their respective courses which lead to the B.Sc. Hons. degree of the Council for National Academic Awards or to a Higher National Diploma. They thus renounce cadet life and their interests become centred in the activities of the Department of Engineering.

Both Cranwell and Henlow have always had a Director of Studies. At Cranwell it has been a civilian appointment for many years, but at Henlow it has been Service. Now a civilian Director of Studies has been appointed for the whole College with Service Assistant Directors in the two Departments. The terms of reference of the new Director are: "to ensure that the College academic standards and practices are broadly in line with comparable civil institutions, and that there is a uniformity throughout in education practices, examinations policy and training records". In other words, he is the guardian of academic standards at the College. The Director also represents the College on policy matters involving outside educational institutions and allied bodies, and this latter aspect is likely to prove a greatly increasing commitment in the years ahead.

The new Director of Studies, Dr. Tolley, who is 40, has until recently been Principal of the rapidly expanding Worcester Technical College. He brings to Cranwell a wide experience in education, including a period at Princeton University as Visiting Research Fellow. He has travelled widely in continental countries, Russia and the U.S.A. on educational matters, is the author of many technical, scientific and educational papers, and has specialized in Management, a subject which is claiming increasing attention at Cranwell. He has also been closely associated with the development of the Diploma of Technology (equivalent to a B.Sc. (Honours) degree) since its inception, and he served as a member of the National Council for Technological Awards from 1959 - 65. This particular experience will be of significant value to Cranwell, and there is no doubt that the academic standards and meaningfulness of the courses at the College will benefit from his wide background.

The R.A.F. College Unit, which is commanded by a Group Captain, provides administrative backing for the whole organisation and also maintains flying facilities for the Department of Cadets though the Department itself, through OC Flying Training Wing, controls all flying instruction. By mid-1966 the population at Cranwell will have grown from 275 cadets, 240 staff officers, and 1,400 airmen and civilians, to 500 cadets, 430 officers under training, 306 staff officers and 1,700 airmen and civilians. This significant increase has required, apart from Trenchard Hall, a large new officers' mess and several associated buildings. The Unit has had its hands full straightening out the many administrative problems inherent in such a merger.

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DEPARTMENT OF CADETS

This Department now has nearly 500 cadets on strength. The course lasts for three years and is split up into six terms of approximately twenty weeks, as follows:

TERM	1	2	3 and 4	5 and 6
Non-Technical Cadets	Officer Training Academics	Specialist Training (Flying, etc.)	The Academic Year (plus a percentage of Officer Training)	Specialist Training, including a percentage of Officer and Academic Training.
Technical Cadets	Officer Training Academics	Academics	Attachments to R.A.F. Maintenance Units	Academic and Specialist Training, including a percentage of Officer Training.

By the end of 1966 Advanced Flying on Gnat and Varsity aircraft will be introduced at Cranwell and GD cadets on graduation will go straight to Operational Conversion Units. Because of the requirements of the B.Sc. and Higher National Diploma courses the technical cadets carry out a different academic programme to their colleagues. Generally speaking, however, officer training is done together and the technical cadets are distributed evenly amongst the four Cranwell squadrons. Some of the cadet staff will be technical officers and already one of the cadet squadron commanders is from the Technical Branch. As has already been mentioned, it is the squadron activity which is of the greatest value in bringing the cadets together and at the end of their cadet training they will be competing for one Sword of Honour, though there will be prizes awarded for the technical specializations as there are for flying or the equipment and secretarial specializations.

Under the new organization all flying training is controlled by the Department of Cadets and the Assistant Commandant (Cadets) has an Assistant Director of Studies (Basic Sciences and Humanities) to advise him on academic matters affecting cadets. As far as the co-ordination of cadet training is concerned the new organization marks a great step forward.

DEPARTMENT OF ENGINEERING

The primary role of this Department is the specialist initial training of technical officers and cadets, and the post-graduate training of technical officers. The Department runs a variety of courses including undergraduate courses designed to produce technical officers of degree level in engineering; courses at graduate level to give service orientation to degree-qualified officers; post-graduate courses, of which the main one is an advanced weapons systems engineering course of one year and eight months; orientation courses for airmen commissioned in the Technical branch; short familiarization courses, and special courses for foreign officers.

The Department is divided into three wings, respectively, Mechanical, Electrical and Management Systems Engineering. The Head of the Department gets his academic advice from his Assistant Director of Studies (Technical) who is an officer in the Education branch.

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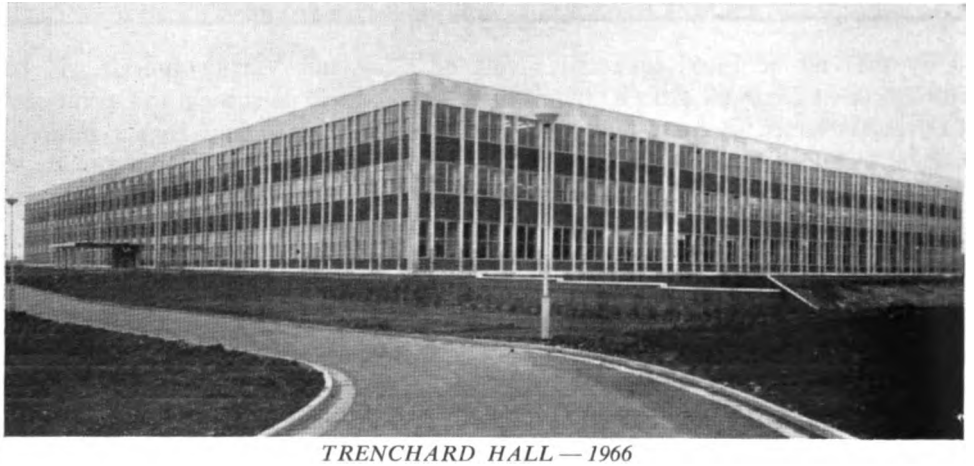
There is no doubt that the Department of Engineering has a vital part to play in shaping the whole future of our Service as it advances further into the technological field. As has already been mentioned, there is a continuous and staggering increase in the complexity and cost of aircraft and associated equipment. This requires the increasing use of graduate-level intelligence and training in the maintenance field as well as in posts concerned with technical development and operational requirements. The Air Force Department through Henlow has pioneered sandwich courses in the Services. The present B.Sc. Hons./HND Courses in Mechanical and Electrical Engineering which are designed to equip Technical officers to fill appointments in these specializations have been outstandingly successful. They are at the moment the only ones of their kind in the Services.



TRENCHARD HALL — 1966

(Crown Copyright Photo)

Management, computer application, cost analysis and cost effectiveness must all sooner or later become accepted and practised techniques in the Royal Air Force. It is anticipated that much of the project and research work in these fields can be carried out at Cranwell under the auspices of the Department of Engineering.

THE FUTURE

It is obvious that with a significant technical and academic staff at Cranwell the Royal Air Force has every reason to expect an intellectual and original approach to Service problems. Undoubtedly the staff of the College will be capable, not only of training cadets and officers, but of handling specific problems put to them by the Service. The staff of the Department of Cadets naturally specialize in all aspects of leadership, and modern management, and it is anticipated that the Service will turn to the cadet staff for advice in all the wide aspects and implications of officer training.

The Royal Air Force is now devoting a great deal of thought and effort to the problem of management in its broadest sense; management courses are being expanded and training in management is being included in certain existing courses in view of the pressing need for all officers to get to grips with every aspect of manage-

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ment. In the past both Cranwell and Henlow touched on the subject, but at the merged College this training must expand dynamically as the Service applies the very latest techniques of Management to the operation, servicing and supply of Air Forces. This training for management should start during cadet life at Cranwell and be continued throughout an officer's career. It is the technical officer who now controls the bulk of airmen and the Cranwell training must ensure that he does this to the best effect and that his GD colleagues know exactly what he is trying to achieve. Scientific management training is a must and the syllabus, which already includes electrical data processing, must be coupled with the use of computers for project and research work amongst staff and students.

As far as the GD, Equipment, Secretarial and Regiment cadets are concerned the trend during the past eighteen months has been away from the policy of external degree qualifications and the emphasis has moved towards turning out first class officers and specialists. However with the significant re-think going on in education as a result of the Robbins Report it may be that under the auspices of the Council for National Academic Awards the non-technical courses of training at Cranwell may be re-designed to merit degree recognition. This would certainly seem to be a desirable prospect but only so long as the efficiency of specialist and officer training was not affected. It would certainly mean that a great deal more uniformity could be achieved in cadet academic training.

FORESIGHT AND DEDICATION

In a very moving ceremony on the 26th June, 1964, the present Chief of the Air Staff — Air Chief Marshal Sir Charles Elworthy, laid the foundation stone of Trenchard Hall. In his short but apt speech he made the following point:

> "We are here today to tread merely a few more steps along the road which Lord Trenchard prepared many years ago. He was the man with vision, foresight, courage and determination who resisted the temptation to invest in the short-term future and insisted on long-term investment, because he knew that by so doing it was the only way to ensure the future integrity and efficiency of the force for which he was responsible".

As the foundation stone was lowered into position the well-loved Frank Cocks — Chaplain-in-Chief at that time — offered the prayer: "May this site now dedicated by our office and ministry, receive the blessing of God, and may the work that shall be done here have good and abiding success". Amen to that.

Trenchard Hall is now built and was opened by the present Lord Trenchard on the 17th May, 1966. Let us hope the foundation has been laid for close co-operation and lasting understanding between the Technical branch and the other branches of our Service, particularly the flying branch, and that the new-style Royal Air Force College will be a united, dynamic and formative force in the continued development of air power, and in the originality of thought and techniques so essential in the latter part of the twentieth century.

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Rolls-Royce Spey power for the McDonnell Phantom II

Pictured here is the Spey-25 turbofan with reheat being prepared for test running. Development of the supersonic military Spey-25 ordered for the McDonnell Phantom II strike fighters of the Royal Navy and Royal Air Force has reached a highly advanced stage. Less than seven months after engine running started the initial flight approval test was completed.

The first engine was delivered on schedule a month later to the McDonnell Aircraft Corporation at St. Louis in the United States of America. The military Spey-25, an engine of high Mach capability, will give the Phantom II greater range, endurance and radius of action and will enable it to carry heavier military loads. The combat performance of the aircraft is also much improved because the military Spey fitted with reheat has a far greater thrust boost than a turbojet and will give the Phantom II a high rate of supersonic acceleration.

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SOVIET ARMY AND NAVY DAY, 1966

By Wing Commander J. F. L. Long, M.A., R.A.F. (Retd.)

TO judge by the speeches, articles and broadcast commentaries, the 48th anniversary of the foundation of the Soviet Army and Navy in February last had much less to offer of significance to the foreign observer than last year's, copious though the comment of the marshals and the admirals once again was. One missed the new notes, which in 1965 could be heard so distinctly even if their meaning could not be interpreted precisely. But it is no exaggeration to say that on the occasion of this year's celebration the marshals and the admirals managed to convey the impression that, whatever differences they may have among themselves about details of military policy, they all support the present collective leadership and wish to live in harmony with it. The fire this year seemed to have gone out of their bellies.(1)

In all ways except one. The references to the international situation were, in general, hotter, more hostile and more specific than last year's. Marshal Malinovsky's warning to the U.S.A. and the West of February a year ago — "Be careful; do not try to intimidate us! " — was remoulded into a scathing denunciation of U.S. activities in Vietnam and of the alleged revanchism of the West German government. Remoulding could be seen, too, in the references to the need to strengthen the U.S.S.R.'s armed forces, which became so notable a feature of the speeches of the Soviet political leaders last summer. Writing in *Pravda*, for instance, Marshal Malinovsky stressed that the armed forces now "possessed everything needed to cool hotheads who are drawing pictures of the destruction of whole states." The existing threat of the outbreak of a new world war must not be understated, he went on, and the "U.S.S.R.'s most important task" was to "strengthen its defence potential in *every conceivable way* in order to be able to punish severely any aggressor who tries by armed force to stop the course of history that is working for communism." "We cannot relax our defence efforts," said Marshal Grechko (C.-in-C. Warsaw Pact Forces), answering questions from a TASS correspondent. "To restrain the aggressor, we must be stronger than he is."

This year it fell to the head of the Main Political Administration of the Soviet armed forces, Army General Yepishev, to deliver the keynote speech at the Soviet Army Central Theatre (which was not, for some reason, covered in a direct radio relay). As befitted the chief representative and watchdog of the Soviet Communist Party in the armed forces, the general's theme was predominantly and even aggressively ideological and he spoke to a brief that all the other marshals and admirals who were marking the occasion in speeches and writings had, without exception, well digested also. The gigantic task of perfecting the technical equipment of the Soviet armed forces, the general claimed, belonged to the party, which was taking "the necessary steps to train highly-qualified military cadres." The party attached con-

(1) See also previous articles on Soviet strategic questions in *The Royal Air Forces Quarterly*, Winter 1964, Summer and Winter 1965.

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siderable importance, he continued, to the inculcation in troops of ideas of political education and party work. The activity of party organizations in the armed forces was at present "greater than ever before." With the decisions of the party's Central Committee as their guiding light, they were "more profoundly and more concretely grasping hold of questions of life" and were "waging a persistent struggle for an efficient and truly scientific approach to the solution of military tasks." The "great and virile force" provided by the exemplary behaviour of members of the party was inspiring personnel to "selfless military labour." Although just pride could be taken, the general conceded, in the success achieved in providing the armed forces with modern equipment, more important was the fact that this equipment was in the hands of commanders and men who had been trained by the party—the "cementing nucleus of the Soviet armed forces" (as he described it in a *Pravda* article), whose "fruitful work" lay in strengthening both "the unity of command and service discipline."

Behind these phrases of General Yepishev, it must be noted, lies more than a year's preparatory ideological work in units and no Soviet serving man listening to the general could possibly mistake his intention. In a nutshell, it was to elevate and dignify the party's ideological mission in the armed forces and, at the same time, create the appropriate atmosphere for this work to be carried forward. This certainly needed to be done. The impression left by what is now a very large number of references to the successes and failures of this mission is not entirely flattering to the party. First, there is still an attitude of robust scepticism among men and officers to party propaganda and resistance, particularly among unit commanders it appears, to any moves designed to give more time to political instruction in already overloaded training programs. Secondly, there are signs — somewhat tenuous, it is true, but unmistakably visible, nevertheless — that the party has not succeeded in eradicating a negative or defeatist approach to nuclear war and may also be worried about lax security standards among Soviet troops, certainly the efforts made in the past year to strengthen discipline and morale by cultivating a pride in the past achievements and the present might of Soviet arms are connected, among other things, with these objects of the party's concern. Thirdly, pressure from above to eliminate the cause of breaches of discipline (especially breaches that arise through the failure of those in authority to exercise their powers) and through gross human failings (like drunkenness and other unspecified "amoral manifestations") appears to be achieving little. Fourthly (and inevitably in view of the persistent and noisy claims of the party to lead and guide the armed services), the difficulties in the way of making the principle of unity of command operate smoothly in practice, while these may well be less than they used to be, are still intractable enough to be a routine matter of comment at the present time.(2) In the light of this evidence can one really accept at its face value General Yepishev's central but vaguely-worded assertion in his *Pravda* article that the "role and significance of ideological work in the forces" had actually *increased* and that "a still greater interest in the study of Marxism-Leninism and of the essence of the general line of the party" had been evinced by servicemen recently? Still greater than what. The general does not say, and nor do any of his colleagues.

(2) The evidence in support of the four points made here is extensive, but the most important single source is an article by Col. General Kalashnik appearing in *Kommunist Vooruzhennykh Sil*, No. 20, 1965.

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In the sphere of strategy, little was said or written on the occasion of the 48th anniversary that has not been said before. Nevertheless, in view of recent indications of a Soviet interest in developing a flexible response capability(3), it is worth recording that Marshal Grechko in his replies to TASS stressed that the Warsaw Pact armies under his command were "ready to conduct not passive defence but active military operations, *immediately carrying them into enemy territory.*" It is also worth mentioning that there was a further underlining of the fact — by General Yepishev — that *all* branches of the armed forces had been "reorganized on the basis of the latest technology — land forces, anti-aircraft troops, the air force and the navy," while the strategic rocket forces themselves had "entered a new stage of development." Ambiguous though this last remark is, it is presumably intended in part to remind the proponents of an exclusive rocket strategy that, in company with the "underestimation of theory" and "manifestation of subjectivism," certain important axioms of the Khrushchev phase no longer obtain. A new nuance, perhaps, may be seen in the point made by Marshal Grechko in his answers to TASS when he said that it is "only by the united efforts (of all branches) that the enemy can be forced to capitulate" (i.e., final victory *assured*) and in another made by Army General Batitsky (First Deputy Chief of the Soviet General Staff) at a press conference when he emphasized that the combat capacity of the land forces in particular had increased considerably with the acquisition of new weapons, including missiles.

Incidentally, very little of value emerges about weapon developments. Possibly the most interesting remark was one dropped at one point in his press conference by Army General Batitsky on the subject of anti-missile defences. "The U.S.S.R.," he said, "had everything necessary to combat enemy missiles successfully at distant approaches to protected objectives." Although this statement is built to the same splendidly imprecise pattern of all earlier ones on this subject, the possible meanings that can be drawn from it are now only three: (a) that development of an anti-missile defence system has now been completed successfully and a limited deployment is about to take place; (b) that a limited deployment is now taking place; and (c) that a limited deployment has been completed. What is chiefly significant is the emphasis on *limited* deployment around objectives of special importance; from what the general said and in the light of earlier public statements from the Soviet side, it is impossible to assert that (b) or (c) is true and (a), in the circumstances, still remains most likely to be true. General Batitsky also tried to make something of the loss over Spain at the beginning of the year of a U.S. military aircraft with nuclear bombs on board. Asked if the U.S.S.R. kept aircraft on patrol armed in this way, the general gave the expected reply of "no." What he did *not* say was that at no time, either now or in the decade in which the Tu. 95 and Mya-type aircraft have been flying, has the U.S.S.R. been capable of maintaining patrols on the pattern of the SAC's. The question that *should* have been asked was surely: *"If* the Soviet Long-Range Air Force disposed of enough intercontinental aircraft to maintain patrols on the SAC's pattern, would it have done so?" Had the question been phrased this way, the general would at least have had to pause before replying.

(3) In particular, the scenario of the *October Storm* exercise of the Warsaw Pact Forces, 1965.

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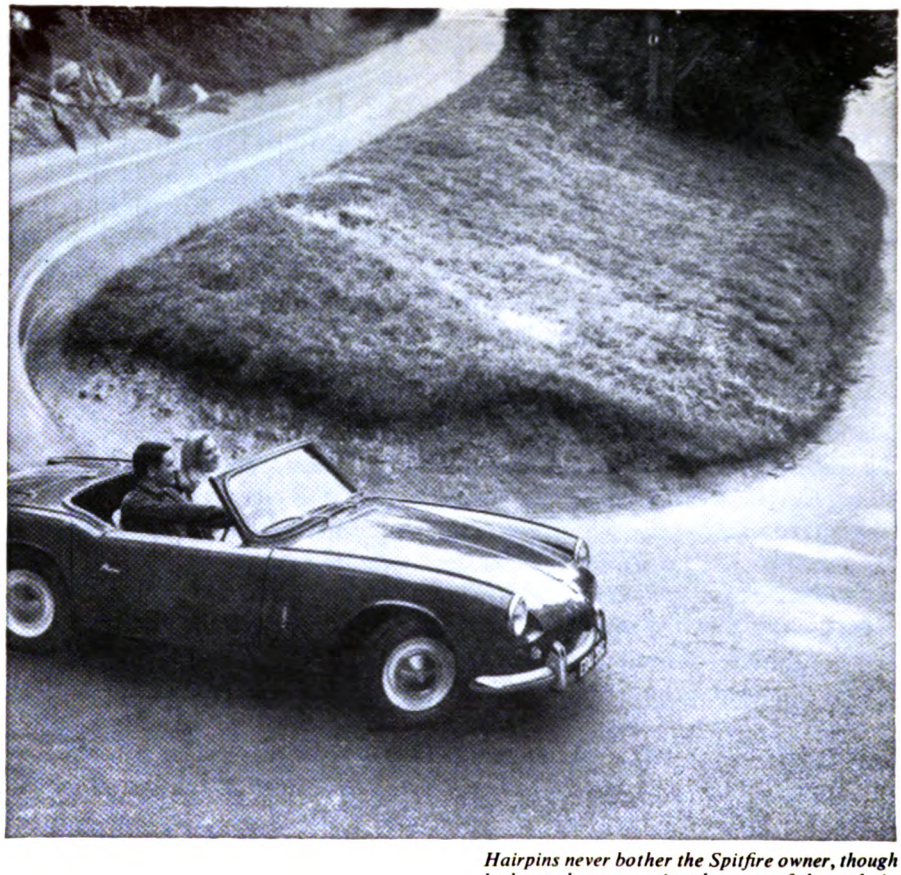

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THE ROYAL AIR FORCE MECHANICAL TRANSPORT FLEET

By Air Commodore G. N. Blake, M.B.E., B.Sc. (Econ.)
(Director of Mechanical Transport and Marine Craft, R.A.F.)

THE mechanical transport fleet operated in support of the Royal Air Force comprises some 50 different types of vehicle—refuellers, snow ploughs, fire vehicles, missile transporters and so on, and totals over 20,000 vehicles. As with other areas of logistic support, the availability of the right vehicle for each different task tends to be taken as a matter of course and the purpose of this article is to tell something of the mechanics behind the introduction of a new vehicle into service, to discuss one or two areas of current interest, and to describe some of the recent additions to the fleet.

The great bulk of the running fleet is deployed throughout the world at operational units and all stations are fully self-sufficient—many with 200 or more vehicles. All servicing work other than major repairs can be handled on the spot since any unserviceability of aircraft tractors, refuellers, or other specialist vehicles would directly affect the flying effort. The policy control of all MT operations is the responsibility of the Directorate of Mechanical Transport at Air Force Department Headquarters. This Directorate is unique in that it covers every aspect of the running of the fleet from the introduction of the new vehicle—through provisioning of vehicles and spares, operating policy, repair policy, personnel trade skills and road safety—to disposals. All these areas, usually the responsibility of a variety of different staff echelons, are brought together under one Directorate to support the single area of MT operations.

This Headquarters staff is therefore well placed to feed back the operating and servicing experience gained from the existing vehicles into the statement of requirements for new vehicles as they are introduced. New requirements are originated by sponsor branches to satisfy a particular need. For example the medical staff will indicate the requirement for a new ambulance, the technical staff for a new refueller and so on. Command Headquarters will also put up requests where operating conditions dictate. This broad statement of the requirement is then subject to examination as to how it might be met and the automative problems involved. When it is agreed that the project is a feasible one, a study is carried out with the aim of producing a vehicle, devoid of frills, which will meet the requirement in any theatre from the Arctic to the Tropics as cheaply as is commensurate with functional efficiency and reliability. From this early study a Staff Requirement is raised which

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TRAILER, SNOW CLEARANCE

1. The trailer, snow clearance was introduced for clearing runways of freshly fallen snow and residual snow left by ploughs. It consists of a pivoting sub-frame, a broom and a centrifugal high pressure blower unit. The broom and blower unit are driven by an installed engine.
2. Snow clearance "down to the black" can be carried out at a rate of up to 100,000 sq. ft. per hour, dependent on the wetness of the snow, and at towing speeds of up to 25 m.p.h.

TRUCK, FIRE CRASH FOAM, MK.5B.

1. The truck, fire crash foam, Mk.5B is now coming into service with the Royal Air Force. It is capable of speeds up to 50 m.p.h. and can negotiate terrain to be found at the runway overshoot areas.
2. Main foam delivery is via a monitor mounted off the cab roof. Foam in excess of 5,000 gallons a minute can be produced on the run, with a 120 ft. throw. Alternative foam discharge can be via four 60 ft. hose lengths sited to each side of the vehicle with a discharge rate of 1,600 gallons per minute per hose and with a throw of up to 65 ft.
3. Chlorobromethane is also carried as a supporting agent. This can be delivered through two 100 ft. hoses at the rate of 8 gallons per minute per hose for two minutes duration.

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spells out, in terms which can be discussed with the other Services and with all branches of the staff concerned, the need and proposed service implementation of the vehicle, its operational and design characteristics, and the estimated cost. Once approved, this Staff Requirement is developed into a detailed specification against which the manufacturers can ultimately be invited to tender.

Each new type of vehicle is subjected to extensive trials to ensure that it matches up to the requirement in operational efficiency, running capabilities and ease of maintenance. It will, according to its type, be in service with the Royal Air Force for anything from 5 - 20 years and during this time it will be maintained at a state of serviceability comparable to its state when new. The particular life span is decided after due consideration of the initial cost, the operating conditions, repair costs and disposal value—for example a Land Rover in Aden may be expected to give six years life, but a 12 Ton crane in a depot of the UK may still be thoroughly efficient after 20 years.

AIRPORTABILITY

Current Ministry of Defence policy requires that all mechanical transport vehicles needed to support tactical operations overseas be designed to be airportable in the appropriate transport aircraft. This requirement necessitates a re-thinking of the design criteria of mechanical transport and no longer are designs to the conventional configurations of the past with a "built like a tank" appearance. Height, length, ground clearance, structural tolerances and basic weight are now of paramount importance and are major limiting factors.

If money were no object, basic weight could be drastically reduced by using the high strength/weight ratio light alloys already tried and tested in the aircraft industry. A relatively simple development trial has been carried out in the use of light alloy road wheels and results showed that four light alloy wheels weighed less than two conventional steel wheels while still retaining equal strength. However, the study went no further when it was revealed that one light alloy wheel cost two and half times as much as its steel counterpart. With costs of this order repeating throughout the vehicle only a very small MT Fleet could be purchased with the limited funds available, and even the Pentagon has recently ruled that light alloy wheels may not be fitted to military transport vehicles. With the prohibitive cost of light alloys, the development of special light-weight chassis and engines is ruled out. The alternative approach of persuading the motor trade manufacturers to develop a truly light-weight vehicle using conventional materials is not feasible while the total requirements for the Royal Air Force are so obviously limited in comparison with the size of the commercial production lines. Basic weight remains a major problem.

However, the judicious selection of a commercial chassis and engine can still pay dividends, for example, in the field of aircraft refuellers, a chassis and engine selected as just sufficiently strong to carry up to 2,500 gallons of fuel as opposed to one strong enough to carry over 2,500 gallons of fuel, having one rear axle as opposed to two, four wheels as against six, etc., can result in appreciable savings in

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TRUCK, REFUELLER DUAL PURPOSE 2,200 GALLONS MK.4

1. The Mk.4 dual purpose refuelling equipment together with the carrier tank is of light weight construction and designed specifically for refuelling and de-fuelling aircraft through one hose reel which can be used for either open line or pressure refuelling. The unusual shape of the 2,200 gallon tank, the compact design of the pump and related equipment, and the detachable cab roof and windscreen enable the vehicle to be airtransported with the minimum of preparation in an Argosy aircraft for use at forward airfields.

2. Pressure refuelling is at a rate of 300 gallons per minute, and open line at 100 gallons per minute. Self loading is up to 200 gallons per minute.

basic weight. These savings, coupled with a specially designed "top hamper" (i.e. cab, tank body and specialist equipment) shaped so as to fit within the aircraft cargo hold, can add up to a major saving in basic weight when compared with a refueller where weight and size are not of paramount importance. The recently introduced airportable refueller Mk. 4 2,200 gallons compares adequately in many respects with the Mk. 2 2,500 gallon. The Mk. 4, however, is 4 ft. 3 ins. lower in height, 6 inches less in width and has a basic weight approximately 20,000 lbs. less. This refueller, as shown in the photograph above, is airportable in the Argosy. A 2,500 gallon refueller is shown in the background.

Again, the standard, short wheel base, Landrover has recently been redesigned for airportability purposes, with a resultant saving of 7 cwt. in the basic weight, while retaining the conventional chassis, engine, transmission, axles, steering, suspension and 4 x 4 drive. Development work and testing is currently in hand also to introduce an airportable, foam-producing, crash vehicle based on the Landrover

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LANDROVER WITH POWERED AXLE TRAILER

1. A Truck, Fire Crash Tactical of similar design to the above is being introduced for deployment in a tactical role to provide fire fighting foam facilities.
2. The vehicle consists of a prime mover fitted with a demountable self-contained foam producing pack and towing a trailer fitted with a water tank. There will be a drive from the prime mover to the axle of the trailer to provide six wheel drive when required.
3. Foam discharge in the order of 1,250 gallons per minute will be available from each of two hoses with a throw of up to 60 ft. for about two minutes duration.
4. The vehicle and trailer will be airportable in the Andover aircraft and the foam producing pack will be airportable as a suspended load by Belvedere and Wessex aircraft.

with a power take-off to drive the trailer wheels—giving a 6 x 6 drive on the standard chassis. A photograph of the power driven trailer taken during trials is shown above. The complete fire fighting train will be airportable in the Andover aircraft.

PETROL OR DIESEL — OR BOTH?

A considerable amount of work has been carried out within the engineering sections of the Motor Vehicle Trade, and many papers have been written, on the merits and de-merits of diesel engines as opposed to petrol engines; this subject is by no means closed. It may be of interest to know that current MOD policy is for an engine that will run on both. The requirement for a multi-fuel engine for military use has arisen mainly from logistic considerations. The diesel engine has a vastly improved fuel consumption of the order of 60% in miles per gallon compared with

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the current spark ignition engine. It can be well understood what such saving in consumption would mean in terms of transporting and distributing fuel to formations in the field, when the quantity required may approach a million gallons per day. In terms of miles per gallon this may be viewed as bringing the scales down heavily in favour of going all diesel.

It is unfortunate that the current designs of spark ignition and diesel engines are each capable of running in a satisfactory manner only on a very limited range of fuels and it may not be generally recognised how severe this limitation may be. For instance, each barrel of crude oil produces only 10% as diesel fuel. On the average, the otto-cycle and diesel engines are each capable of consuming 25 to 30 per cent of all the hydro-carbons available in the crude oil, therefore an ideal engine would be one capable of burning either or both of these fuels with comparable efficiency. Even better would be a multi-fuel engine capable of burning a much wider range of the hydro-carbons available in the basic crude oil and capable of functioning correctly, with unimpaired reliability and life, on fuels having widely varying physical properties.

The services formulated requirement is now for a multi-fuel engine capable of operating efficiently on any range of fuel from ordinary diesel fuel (or Derv), up to 80 octane petrol and also on Avtag, which is a widecut gasolene used for aircraft gas turbine engines. Development has reached the stage where the opposed piston, two stroke, multi-fuel engine is now a firm reality, and service trials running of multi-fuel engines have already exceeded 100,000 road miles.

FUTURE MT FLEET

As to the future, the R.A.F. MT fleet will continue to operate:—

a. Commercial type passenger and load carrying vehicles—the requirement being met by buying standard commercial vehicles with but minor modifications to suit Service requirements.

b. A limited number of General Service vehicles—specially designed to Ministry of Defence specifications, with strengthened chassis and body and with 4 x 4 or 6 x 4 drive for cross-country work.

c. Specialist vehicles peculiar to R.A.F. requirements, with a standard chassis/engine wherever possible, but with a top hamper designed to support the primary role of the vehicle.

In all cases it is the aim to use chassis and engines in common use in the other two Services. In this manner the provisioning of spares and problems of repair are simplified.

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OFFICIAL CORRESPONDENCE AND SERVICE WRITING

By Group Captain E. B. Haslam, M.A.

Introduction

1. In the field of official correspondence and service writing there have been some recent changes and advances which were long overdue. There are still many officers, however, who through lack of training, through lack of practice or sheer ingrained bad habit continue to perpetuate forms of service writing, eg, abbreviations, long since superseded. Others in despair or under increasing pressure of work have surrendered care and control of such matters to the outer offices of the typing pool and the clerical help. The lack of regard for conventions is often defended on the virile grounds of getting on with the job and leaving the trimmings to others. It is usually the product nevertheless of inadequate staff training. A disciplined Service needs a disciplined format of staff procedure and service writing just as it needs common patterns of uniform.

Recent Changes in Service Writing and Staff Training

2. On 1st April 1964, the Joint Service Staff Manual, JSP101, came into force. This marked a significant stage in the standardization of staff procedures and service writing within the three Armed Services. It incorporated not only the results of prolonged inter-Service deliberation but also the Standardization Agreements approved by NATO and SEATO. Standardization could go only so far and differences continue to exist in the practice of official correspondence within the Ministry of Defence itself, in Government departments other than the Ministry of Defence and of course in civilian life outside the Armed Forces. The Rules for Typists in JSP101 begin with the somewhat equivocal statement: "The instructions which follow are mandatory for service typists and are a guide for civilian staffs in the preparation of typewritten work."

3. Of perhaps equal significance for the improvement of standards of service writing in the Royal Air Force was the inauguration of the Individual Studies School at the Royal Air Force Staff College, Bracknell in January 1966. By means of guided tuition by correspondence over 600 officers this year are receiving direction in the forms of official correspondence and service writing they are expected to use in normal single service staff employment. This is one aspect of their first year's study in a two year course by correspondence. The course itself marks one stage of a Progressive Education Programme which aims at giving full career officers

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continuous and systematic non-specialist officer training from junior officer ranks through to senior command and staff appointments. In this way it is hoped that all full career officers, and not merely the relatively small percentage who are selected for Staff College training, will receive some basic instruction in staff procedures and service writing. Additionally, this training is to be given to Supplementary List Squadron Leaders many of whom, in the past, received little or no staff training. The effect on the standards of official correspondence should become apparent within the next three years. Hitherto, in fact, many officers have been expected to fill staff appointments without adequate qualification or preparation for the task. They have improved their performance by on the job training becoming, to use an Army expression, staff qualified in the process. This has now been identified as an inadequate and unsatisfactory method of discharging official business.

The Need for Conventions

4. Why do we need standard conventions of service writing? Official correspondence on defence matters is concerned primarily with effective communication of information. orders and instructions usually with the intention of procuring desired action. The hallmarks of successful service writing are accuracy, clarity, logic and brevity. Anything which helps to focus attention onto the matter under discussion is a valuable aid to correspondence. It is for this purpose that we employ accepted formats and conventions of service writing. The attention of the reader, and the writer, is thereby directed to the thought processes of the matter under discussion and is not distracted by individual or unorthodox styles of correspondence. There is a danger, one may argue, that excessive adherence to convention produces stereotyped letters with overworked phrases and clichés. This is not an argument against the use of an accepted format. It is an argument against inadequate thinking by the writer on the subject under review.

5. Comparison with civilian practice especially in commercial correspondence is illuminating in this respect. There is, by and large, no definitive document such as JSP101 to guide civilian correspondence. It is true that such books as Titles and Forms of Address and Manual of Commercial Correspondence have secured wide acceptance. But basically usage and the previous practice of the firm supply the patterns for commercial correspondence. In certain technical and specialist fields of correspondence agreed standards are achieved through the examination requirements of the Royal Society of Arts, the London Chamber of Commerce or professional bodies such as the Chartered Institute of Secretaries. But commercial practice like British constitutional principles is the product of previous usage adapting itself to a changing society. The introductory note to the most recent edition of the Manual of Commercial Correspondence acknowledges that commercial correspondence, if not exactly in a state of flux, reveals great differences between letters of today and those, usually more formal, styles of correspondence which were typical, say, twenty years ago. The Services in short are well provided for with an authoritative written form of words to guide their official correspondence and service writing.

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Composing Routine Letters

6. In the course of a brief article it is impracticable to discuss in detail the forms of approved official correspondence. It is not needed either by those who care to consult the very detailed guidance in the first three chapters of JSP101 or the relevant chapters of the MOD Office Instructions. The latter explains the variant procedures peculiar to the Ministry of Defence. As in commercial correspondence, there has been a general tendency in service writing to move away from a too rigid formal letter towards the more flexible, functional form of the Routine letter. A few general reflections on letter writing therefore may be of interest and the Routine letter is taken as the vehicle for discussion. Naturally the ensuing remarks relate to letters where the subject matter is of more than ephemeral or minor significance.

7. A letter is usually composed as a reaction stimulated by someone else's thoughts conveyed by letter or other form of service writing.

[The staff officer who starts the reaction by committing original thoughts to paper is of course a rare and valuable being.]

A letter which embodies an effective response to the thought stimulus provided requires a clearly conceived line of thought expressed in appropriate words. But the requirement is more subtle; succinct and logical thought may not be enough. Letters have tone and may convey to the recipient more than the thought content intended by the sender. The Ministry of Defence Office Instructions baldly but sagely remark: "In dealing with correspondence it is often useful to imagine oneself in the place of the person at the other end." In commercial correspondence the position is sometimes stated with yet more frankness. "Letters should contain some padding designed to produce a certain effect." We have in fact the classic situation known to literary men of the relationship of Content and Form and a satisfactory letter is one in which the two are wedded to achieve the desired result on the reader.

8 In deciding the content of a Routine letter it will often be found helpful to think of it as a miniature service paper. Its structure is generally tripartite consisting of Introduction, Development and Conclusion. The new format involves putting references at the heading of a letter after a short but not too limiting general title. This assists to focus attention onto the matter under discussion. It should also assist office staff to flag and cross-refer correspondence so that the recipient of a letter, with good clerical help, can expect to read himself into the relevant case history of the subject. The first paragraph, or paragraphs in a long letter, should then set the scene advancing the argument to the point where new material can be introduced as the Body or Development of the letter. The argument which follows is best organized by paragraphs or units of thought and expression which mark discrete stages of thought. Like the opening, the closing paragraph must impress the reader forcibly. The information sought, the decision communicated or the action required should emerge positively leaving the reader with a clear impression of what is involved. Often it may be necessary in a long letter to summarize the points of argument advanced in the body before a short concluding paragraph rounds off the letter.

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9. The marriage of thought and words takes us to the heart of the artistic and stylistic problem of composition. Whatever style is used, style is merely a means to an end; it must not be an end in itself. Military men can usually convey thoughts clearly by using simple sentences. These involve fewer problems of syntax, they avoid punctuation marks and there is likely to be less hesitancy about vocabulary and orthography. A writer creates a style by expressing himself. If he conveys clearly and unambiguously what he has thought out in all honesty, then his style will be convincing. No meretricious addition of Latin tags or polysyllabic periphrasis can rescue poor thought. The writer who has something to say in military correspondence had better say it as simply and succinctly as possible.

10. False tone, whether deliberately imported or unhappily introduced by chance phrases, should be eliminated. The impact of the written word is more cutting and deadly than, say, the spoken reproof. If you compose a pungent, brilliant minute to lacerate your colleague, the best advice is to put it away overnight. In the morning read it through, admire your own literacy, then tear it up and go round to talk about it to your colleague. Too much correspondence is self-generated or self-perpetuating leading to no fruitful action. The Duke of Wellington's strictures on the army of scribblers who impede decision making processes are still relevant today.

11. A letter — even a Routine letter — can become an instrument for original, creative thought. A letter is the expression of the writer's thought and may give an indication of the sort of person he is. The writer of the following excellent advice in the Ministry of Defence Office Instructions had this in mind when he stated: "A letter can give an impression of efficiency, of promptitude, of trouble taken and of effort made to understand the recipient's viewpoint; or it can convey the reverse of all these things."

DELIVERY OF ARTICLES TO EDITOR

The *final dates* upon which articles must reach the Editor for inclusion in the Spring, Summer, Autumn and Winter numbers are: —

SPRING (MARCH)	22nd DECEMBER
SUMMER (JUNE)	25th MARCH
AUTUMN (SEPTEMBER)	24th JUNE
WINTER (DECEMBER)	23rd SEPTEMBER

It is sincerely hoped that contributors will not wait until the very last day before dispatching their articles to the Editor, as this can seriously disorganize the works schedule for getting the "Quarterly" to press and could delay its date of issue.

The early delivery of copy would be greatly appreciated.

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Oldest Air Force Staff College

By Wing Commander D. S. Sanderson

DESPITE repeated rumours of impending closure in recent years, the R.A.F. Staff College at Andover — the oldest Air Force Staff College in the world — has continued to draw students of many nations for a year's study of air power, air force staff work and allied subjects. The Course which began on 10th January, 1966, is in fact the biggest there since 1939; the 46 students represent 16 countries, ranging from Norway to Chile and from Ghana to the Philippines.

Nevertheless, the end of Andover is in sight. The Minister of State for Defence (R.A.F.) announced last year that the Andover and Bracknell staff college courses will be combined at Bracknell as soon as the necessary preparations can be made there. It seems likely that in December, 1969, Andover will close its doors behind its last graduating course. After 47 years, this historic College will pass into the annals of the Royal Air Force and the memories of former students across the world. For, founded to serve one Air Force, it has ended by serving many.

Inception

The Royal Air Force owes its staff colleges, like so much else, to the vision of Lord Trenchard. "The generals and admirals said the air force should use the existing services and their colleges . . . . I decided—and gradually convinced my Secretary of State—that we ought to defy the other services and risk unpopularity by building foundations with nothing much else to show—but foundations that it would be hard to destroy."[1] When Air Marshal Sir Hugh Trenchard formally presented his Memorandum on the Permanent Organization of the Royal Air Force on 25th November, 1919 (Cmd Paper 467), his "foundations" included few of the fighting squadrons which a year earlier had made up the largest Air Force in the World. ("I wanted very few squadrons—just enough to gain experience and carry out domestic rôles in our overseas territories when local emergencies arose.") [2]

Of the £15 million allotted to the Royal Air Force for that next financial year, Trenchard earmarked no less than £13 million for the land, the buildings and the

1. "Trenchard" by Andrew Boyle, Collins, London 1962, P.341
2. Idem

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technical facilities needed for his new Service. An early purchase was the Rothschild house and estate at Halton, intended to provide the permanent location for two of his three new basic institutions; a training school for boy apprentices and a Staff College: the third, a college for officer cadets, was to be at Cranwell.[3] In the lean years that followed, however, the Staff College project had to be deferred. Yet Trenchard would not give it up: if he could not find the money to build, then the Staff College must be started in a temporary home.

A good location was offered by the Royal Air Force station at Andover, where there were surplus buildings. They were not as dignified or impressive as might be wished; R.A.F. Andover had been opened in 1917 and the bungalow buildings were largely the work of German prisoners-of-war. Nevertheless, for only £18,000 a Staff College could be housed, for the present, in adapted buildings and in acceptable surroundings. In 1921, the scheme was put in hand.

True or not, it was widely believed at the time that Andover's first Commandant originally refused the post. In 1921, Air Commodore Brooke-Popham was the Director of Research at the Air Ministry and is said to have declined the Staff College appointment. When pressed he asked if "he might see the names of the alternative possible appointees. He contemplated the list for a few moments and then said resignedly: 'Well, I suppose I had better take it.' "[4]

Air Commodore Brooke-Popham arrived at Andover on 14th November, 1921. As he recounted it many years later—

> "Next morning, after some delay caused by locking myself into a bathroom with a spring lock on the outside, I proceeded to the small office allocated to me and sat down to an inkstand with no ink and a penholder without a nib. However, with the aid of Sergeant Major Bethel, a form for indent of stationery was filled up and with its signature I felt that the formation of the Staff College had commenced".[5]

In the next few months the College's strength built up to an establishment of 75 airmen, an Adjutant and five Directing Staff officers. Also on the establishment were four aircraft (two fighters and two bombers) to enable students and staff to keep in flying practice. By the beginning of April, 1923, a syllabus had been prepared and the College was sufficiently ready for its formal opening.

Of the 20 students on the first course, six subsequently held appointments as Commanders in Chief and one of them (Portal) became the Chief of Air Staff. The senior student, Wing Commander (subsequently Air Marshal Sir John) Baldwin, looked back later on his year there with mixed feelings:

> "Much as we enjoyed the Course, I am certain that the majority of us experienced a genuine feeling of relief at the close of the final term. It's not all beer and skittles being a guinea pig, especially when the victim knows the nature of the experiment."[6]

3. Air Ministry Archives, 1919
4. "A History of the Air Ministry", C. G. Grey, Allen & Unwin, London 1940, P.188
5. "The Hawk" (Journal of the R.A.F. Staff Colleges), December 1950, P.18
6. Idem, P.21

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The first overseas students attended the second Course—an Australian and a Canadian. Naval and army officers were added and the average strength of the courses rose to thirty students. Under the pressure of pre-war expansion, the 1938 Course was increased to 39 students and the 1939 Course to 65. When this Course was interrupted by the outbreak of World War II, nearly 500 R.A.F. officers and some 50 naval, army and Dominions Air Force officers had graduated from Andover.

From 1926 onwards a number of ideas regarding a permanent home for the Staff College had been discussed. Fruition came only on July, 1939, when the Chief of Air Staff, Air Chief Marshal Sir Cyril Newall, inaugurated work at Ramridge House, a Queen Anne mansion three miles from Andover. Six weeks later, war stopped the work and it was never resumed.

Interregnum

Short war Courses began at Andover in November, 1939, only to be interrupted again in May, 1940. Eight years elapsed before another Course convened at Andover, but the value of its training was never in doubt. Although the College buildings were damaged by bombs in 1941 (years later, a German Air Force student conjectured, in the absence of his wartime log book, that he had flown on the raid), short war Courses were resumed in January, 1942, at Bulstrode Park in Buckinghamshire. The R.A.F. opened a second Staff College at Haifa, moreover, to provide the same training for officers serving in the Middle East theatre.

Soon after the end of the war, the R.A.F. Staff College as such found its final home at Bracknell. Bulstrode Park was retained, first as a separate Wing and later as a separate College, to provide parallel training courses for officer students of allied and friendly air forces, with an equal number of R.A.F. students, amounting to about 35 in all. When, in 1948, Bulstrode Park had to be relinquished, the College there moved back to the old Staff College buildings at Andover.

The Second Phase

The historic manor house in Bulstrode Park had a well-authenticated resident ghost: Andover offered only congenial spirits in its resuscitated buildings. The former drawing office was pressed into service as the lecture room and, in time, the bomb-damaged offices were rebuilt and extra syndicate rooms added to provide for larger courses.

Lord Trenchard, over the years a regular visitor to the College, spoke there for the last time in 1953. From the speaker's platform the audience was patently different from the inaugural Course he had addressed thirty years earlier: alongside a similar number of R.A.F. students sat two W.R.A.F. colleagues, the first to attend Andover; with them, and making up half the Course were officers from Ceylon, Eire, India, Indonesia, Israel, the Netherlands, Pakistan, Portugal, Thailand and the United States.

More than any comparable institution, Andover had become, and is, an international Staff College. No distinction is drawn between British and foreign students:

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all attend the same lectures, work on the same exercises and go together on the same visits. From the Commandant's opening Address to the End of Course Revue, the academic year is identical for all students. The syllabus itself is national, of course, and runs in parallel with that of Bracknell. Indeed, the only significant difference in curriculum between Bracknell and Andover is that some of its exercises are necessarily adapted or remodelled to a lower security grading. The unique camaraderie of the older College derives from its smaller size and from the high proportion of foreign officers. The one makes for informal and easy relationships between Directing Staff and students, as between students; the second engenders a rare fellowship between men of all nations who find themselves working and relaxing together for a year, and an important year, of their lives.

In passing, the importance of Andover to foreign students may be gauged from the fact that ten have become Chiefs of Staff in their own Air Forces.

Those who experience Andover's singular atmosphere of international amity and endeavour never forget it. It will be the particular task of those who plan the merger of Andover and Bracknell to retain, in the new environment, something of the special character of the oldest Air Force Staff College in the world.

VISIT BY 27 FOREIGN AIR ATTACHÉS

In the photograph on the page facing are the following foreign Air Attachés who visited Andover in 1965 and watched students at work on an exercise called "WARLORD".

***Lt. Col. E. B. Meincke** (Denmark); Col. W. Koch (Switzerland); Col. S. G. Muzzamil, C.V.O. (Sudan); Col. F. Galarza (Spain); Lt. Col. J. Krubner (Czechoslovakia); Col. J. M. De Bettencourt Rodrigues (Portugal); Col. O. T. Mehn Andersen, D.F.C. (Norway); Col. K. Kalafat (Turkey); Lt. Col. Markowski (Poland); Col. J. L. F. Biot (Belgium); Capt. P. Le Clus (South Africa); Lt. Col. H. Buttlar-Elberberg (Austria); Group Capt. Bancha Sukanusasna (Thailand); Capt. (Naval) P. Karvajal (Chile); Maj. Gen. J. Soldi (Peru); Col. G. Popa (Rumania); Col. T. Chiantia (Italy); Col. J. B. Kim (Korea); Col. E. A. Abdou (U.A.R.); Col. G. Semenov (U.S.S.R.); V-Cmdr. A. L. Garrido (Argentina); Lt. Col. G. Mehalko (U.S.A.); Air Cdre. Wigjosapoeto (Indonesia); Maj. Toth (Hungary); Cmdr. (Naval) A. Mirkovic (Yugoslavia); Col. G. H. Aghakhani Afshar (Iran) and Wing Cmdr. L-O Ohlson (Sweden).*

ESCORTING OFFICERS: Wing Cmdr. P. J. Halford, A.F.C., R.A.F., and Sqdn. Ldr. M. K. Forter, O.B.E.

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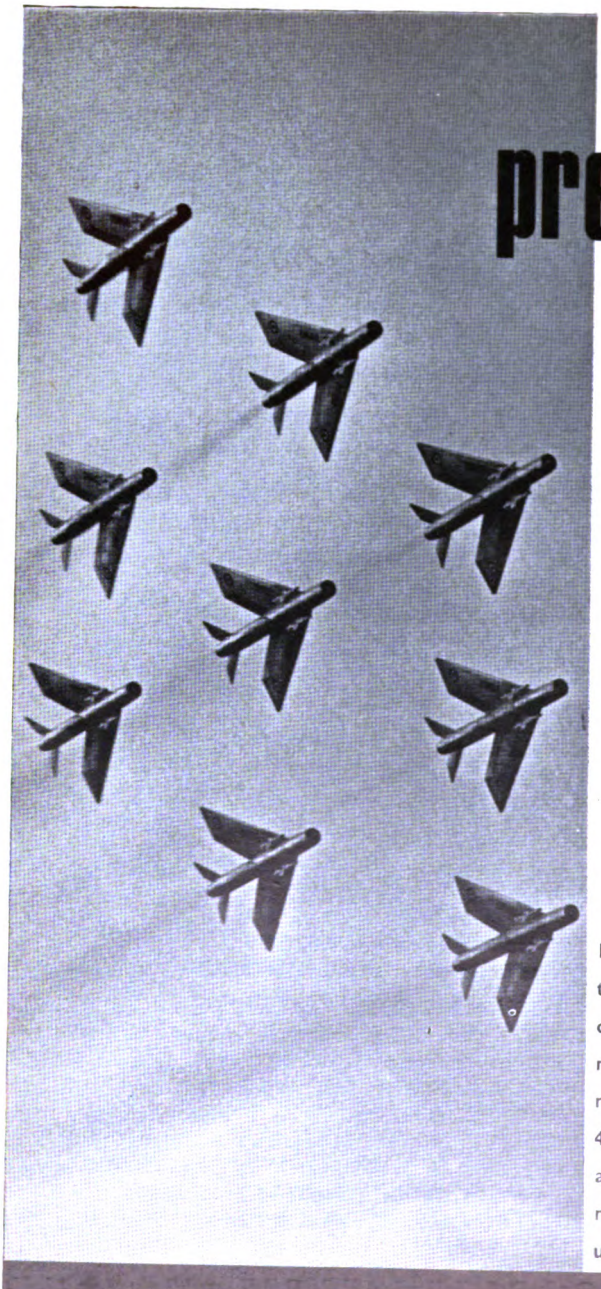

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Ret.)

THE DEFENCE REVIEW

THE results of Her Majesty's Government's defence review were published in the form of a White Paper[1] on 22nd February, 1966, and a defence budget for 1966/67[2] appeared at the same time.

The Defence Review was a disappointing document. After eighteen months of intense investigation by the Government into our overseas commitments and the requirements of defence, we were surely entitled to expect an authoritative, comprehensive and categorical statement of our interests, obligations and commitments which form the background to our foreign policy, and of the forces necessary to support and implement them. Indeed, on Page 4 of the Review we read: "Defence must be the servant of foreign policy, not its master. Military forces must be designed accordingly." But what do we find after that unexceptionable introduction? We find that the Government, instead of applying this admirable (if somewhat obvious) principle, has fixed an arbitrary limit of £2,000 million (at 1964 prices) per annum and then proceeded to determine what men and what weapons to buy for that amount of money.

The most important announcements in the Defence White Paper are these: Britain will buy fifty F.111A swing-wing supersonic low-level bombers for the Royal Air Force; the Royal Navy, with its Polaris submarines, will assume full responsibility for our contribution to the N.A.T.O. nuclear deterrent forces from 1969/70 onwards; the Fleet Air Arm is to be run down and no new aircraft carriers are to be ordered; but a more powerful class of guided-missile ships will shortly be under construction for the navy.

We are told quite definitely that we cannot have the F.111A's *and* a new carrier because our financial resources would not run to both. While there is general agreement that the F.111A's are necessary; there has been strong political and professional opposition to the policy of running down the Fleet Air Arm and of depriving the Fleet of its aircraft carriers after the present ones become obsolete. (*Ark Royal* is, however, to have an extensive refit.)

1. Defence Review, Cmnd. 2901 (H.M.S.O., 1s. 9d.)
2. Defence Estimates, 1966 Cmnd. 2902 (H.M.S.O. 8s. 0d.)

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What then is the background to these startling decisions? Our ground forces in Germany are to remain at their present level; but the R.A.F. in Germany is to be reduced in 1970. Our responsibilities to Libya and Gibraltar are to be continued, and we shall still provide the nuclear strike element of C.E.N.T.O.; but the garrisons of Cyprus and Malta are to be reduced while the bases remain. British forces will leave Aden in 1968, after South Arabia has become independent, and some of them will be based thereafter in Bahrein. In the Far East, our "military presence" is to be maintained in collaboration with our Commonwealth partners and Allies; we shall continue to use Singapore as a base, provided that is agreeable to the Government of that independent state; our total forces in the Far East are to be reduced as soon as circumstances become favourable; and an alternative base to Singapore is to be sought in Australia — "just in case." We are to remain in Hong Kong; but our troops will leave British Guiana when that colony becomes independent, and those in Bechuanaland and Swaziland will also be withdrawn as soon as the Rhodesian situation is stabilised.

In terms of aircraft, the 50 F.111A's (which should be available to the R.A.F. in 1970) will be supported by the V-bombers acting in the short-range low-level non-nuclear strike role (when the latter are relieved of their nuclear duties by our four Polaris submarines in 1970). 200 Phantom fighters will be shared by the Royal Air Force and the Royal Navy; and these will be supplemented by numerous Kestrels (P.1127) with V.T.O.L. capability. In terms of ships, existing carriers will be periodically refitted during the next ten years, and *Ark Royal's* first refit will equip her for Phantoms and Buccaneers. The navy will also have (by way of compensation for the threatened loss of her carriers?) a new type of guided missile ship (Type 82) firing surface-to-air and anti-submarine missiles, and a new type of helicopter ship.

The Government's reasons for abandoning the proposed new aircraft carrier (CVA-01) are quoted in these words: "This ship could not come into service before 1973. By then, our remaining commitments will not require her, and the functions for which we might otherwise have needed a carrier will be performed in another way . . . Experience and study have shown that only one type of operation exists for which carriers and carrier-borne aircraft would be indispensable . . . that is the landing or withdrawal of troops against sophisticated opposition outside the range of land-based cover."

This statement is based upon a wholly unwarranted claim to be able to forecast the precise circumstances of a future war, and it completely ignores the navy's need of aircraft *under its own control* for its own protection. And it is inconsistent with the following passage found elsewhere in the White Paper: "The aircraft carrier is the most important element in the Fleet for offensive action against an enemy at sea or ashore, and it makes a large contribution to the defence of our seaborne forces. It can also play an important part in operations where local air superiority has to be gained and maintained and where offensive support of ground forces is required." But no doubt we may safely leave the Royal Navy to put its own case, while emphasising the fact that inter-Service rivalry (if any still exists) has no part in this particular argument, which is concerned solely with Britain's defence requirements and the equipment necessary to satisfy them.

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Criticism of the Government's defence policy was prompt and emphatic, and the resignations of the Minister of Defence for the Navy (Mr. Christopher Mayhew) and of the First Sea Lord (Sir David Luce) added point and weight to the protests. Mr. Enoch Powell, the principal Opposition speaker on defence matters, complained mostly of the arbitrary limit of £2,000 m. placed upon the defence budget *before*, as he averred, the Defence Review had been properly completed. *The Times* leader said, on 23rd February: "The danger must lie in the Government's concentration on the dominant weapon—in this case the F.111—at the expense of all the secondary defences required to maintain a balanced presence. Deterrence by bombers is all very well, but will it take care of minor interference with shipping? Will it prevent sniping against ground forces, or increased guerrilla activity?"

The *Daily Telegraph* leader concentrated on the decision to withdraw all British forces from Aden in 1968 which, it said, would leave South Arabia wide open to Nasser; and it added: "What is even more incomprehensible . . . is that a decision to run down the aircraft carrier fleet should have been taken simultaneously . . . Mr. Healey is quite wrong when he says that carriers are indispensable only against sophisticated opposition. They are equally indispensible for unsophisticated 'brush-fire' operations, where they can provide radar screens, slow-flying aircraft for use over rough country, paratroops for seizing airfields and Marines for landing." These criticisms are all valid. Aircraft carriers form the nucleus of self-contained maritime task-forces of all arms. They can operate in any of the oceans and in all countries which lie adjacent to them, including all those in which Britain and the Commonwealth (as well as the United Nations) have interests and responsibilities; and such task-forces are ideal for a maritime power such as Britain. While paying due regard to our need for air power (as we have done by ordering the F.111's), let us make sure that we do not neglect sea power, for to do so would be fatal.

Debates in Parliament

The Defence White Paper was debated in the House of Commons on 7th and 8th March and in the House of Lords on 8th March. Mr. Enoch Powell (Conservative spokesman on defence matters) opened the debate on 7th March; but he spent most of his time attacking the Government on party lines. His main complaint was that the Government had selected a financial limit within which to plan our defence expenditure with the result, as he put it, that the ability of our forces to carry out their duties would be impaired. As Mr. Mayhew had said, in justifying his resignation, it was asking too much of Service men to do their job with inadequate equipment. In particular he deplored the decision to evacuate the Aden base in 1968 and to abandon the navy's aircraft carrier force after the 1970's. He also challenged the Government's decision to buy the F.111A's as a replacement for the Canberras pending the availability of the Anglo-French variable geometry aircraft which, he said, did not yet exist "even on the back of an envelope." This was "an insult to our intelligence and to our information."

The second day's debate in the House of Commons was opened by Mr. Carr (Conservative spokesman on aviation). He said that the Government did not seem

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to know for what role they wanted the Anglo-French variable geometry aircraft. It was presented in the White Paper as the ultimate replacement for the Canberra; but in May last year, Mr. Healey had said that it would replace the Buccaneer, the Lightning and the Phantom. It was, by comparison, a small plane and had only two-thirds of the range of the F.111A. (*We have previously suggested that its conversion to the low-level strike/reconnaissance role was impracticable.*) We should, he contested, if we intended to buy F.111's buy more than 50 in these circumstances.

Mr. Healey (Secretary of State for Defence) said that the next generation of aircraft, the F.111A, the Phantom and the Anglo-French variable geometry aircraft, would fulfil more roles than any of their predecessors. Nowadays, he explained, a new aircraft was not simply a replacement for an existing one; it could be a replacement not for one but for three, or even four, aircraft. He assured the House that 50 F.111A's would be enough; for we should be able to use the V-bombers (when relieved of their nuclear deterrent duties) in the strike role "against less well-defended or less distant targets." Most of the F.111's would be based in Singapore, which was intended to be our main base in the Far East *so long as we were able to retain it on acceptable conditions.* (My italics.) "If we are required to leave Singapore," he continued, "then of course we shall keep them in Australia." Some F.111's would be kept in Bahrein and Gan; and, if we were working in Australia, at Darwin and in the Cocos Islands.

In the House of Lords, Lord Shackleton (Minister of Defence for the Royal Air Force) explained the Government's defence policy as outlined in the White Paper. He confined himself mainly to the purchase of the F.111A's, to the evacuation of the Aden base, and to the Government's decision not to build aircraft carriers for use in the late 1970's; and his arguments were much the same as those in the lower House. He denied that the disappearance of aircraft carriers would be the end of the Royal Navy as a force capable of global operations. He said that the prospects of the Royal Navy and of the Royal Air Force were both rosier than ever. Lord Carrington (Leader of the Opposition in the House of Lords) said that the Government's aircraft carrier policy had removed the eyes of the navy and all its teeth, and cut off the hands which it used in its self-defence. He also wondered how many countries in South-East Asia had runways, the sophisticated workshops or the storage space necessary for maintaining the F.111 force. He considered that it would not be possible for Britain to discharge her commitments East of Suez without the maritime power provided by a carrier force. The Opposition, he added, had decided that they would go ahead with the cancelled aircraft carrier force because it was much too early, in 1966, to make statements about what would happen in 1976. We could not agree more!

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REFLECTIONS OF A BUSY YEAR

By Malcolm Miles

ANNUAL Reports or Company Reports are usually terse and concise reviews of the activities of the past year, its successes and sometimes its failures, and they are usually of limited interest and often very dull reading.

One such report which is not of limited interest and certainly not dull reading is the Annual Report of the Royal Air Forces Association — no doubt because it is pre-occupied with people rather than finance.

The key-note of this well-presented Report is one of happy optimism born of a highly successful and busy year. It was the twenty-fifth anniversary year of the Battle of Britain and the aims and efforts of the Association were geared to match the inspiration and spirit of those critical days.

It was recognised at the outset of the year that it would be a critical one for the Association. With rising costs and increasing commitments in all fields of the R.A.F. Association's wide welfare services including the maintenance of two convalescent homes, Richard Peck House and Sussexdown and the new Home for the permanently disabled, it was of paramount imporance that, if all this good work was to continue at its present high standard of usefulness, the welfare income must be substantially increased. Furthermore, it was urgently necessary to replenish the capital fund depleted by the purchase, enlargement and adaptation of Sussexdown for the care of the seriously disabled in order to have the means available for any further welfare projects which the Association may be called upon to undertake in the future.

This challenge was immediately taken up by the members with optimism and enthusiasm — with some startling results. At the end of the year the chairman of the Central Council, Air Marshal Sir Harold Lydford, who presented the Report to the Association's Annual Conference at Harrogate, was in the happy position of announcing a year of records.

The Wings Appeal total for 1965 of £103,228, the major source of welfare income, was a record by a large margin. Included in this figure is another record, the collection of £12,394 made in the theatres of the Rank Organisation. Miss Anna Neagle's appeal on the BBC was the most successful appeal on this medium during September. Altogether, a most encouraging report, these results ensuring, as they do, that the welfare work which the Association undertakes for all serving and ex-service members of the Royal Air Forces and their dependants who need a helping hand wherever they may be in the world will not be hampered or limited by financial considerations — at least during the current year.

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Her Royal Highness the Duchess of Gloucester, Vice-Patron of the Royal Air Forces Association inspects the well-equipped occupational therapy workshop on her tour of Sussexdown after declaring this Home officially open. With Her Royal Highness are Air Chief Commandant Dame Katherine Watson-Watt, chairman of the Homes Management Committee and Air Marshal Sir Robert Saundby, a life Vice-President of the Association.

Welfare is a much-used — and mis-used — word which can mean a little or a lot. In reading the lengthy section under this heading in this Report, one is left in no doubt what it means in terms of wide scope and human understanding in its interpretation by the Royal Air Forces Association.

How its facilities are promptly available to those in need wherever they may find themselves — from Hong Kong to San Francisco or from Lima to Oslo — is a magnificent pattern of voluntary organisation backed by the specialist services at Central Headquarters in London and nine Areas in the United Kingdom and Northern Ireland, wherein naturally lies the bulk of the membership.

Worthy tributes are paid in the Report to the fine unselfish and often unheard-of, work quietly and efficiently undertaken by the honorary welfare officers who are based at each of the Association's 724 branches, 69 of them overseas; to the close co-operation and understanding which exists in all fields of welfare endeavour between the Association and the Royal Air Force Benevolent Fund, and to the spirit of collaboration which exists in the Service and ex-Service world which finds expression through the Joint Committee of British Service and Ex-Service Organisations on matters of policy at Ministerial level.

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It is clear from the Report that whether it is a major policy problem affecting the entire ex-service world or whether it is one of the thousands of personal problems which people find themselves facing from time to time, the Association is there with lively interest and practical help.

Many other facets of the Association's work and life are reported, such as the fact that for the seventh successive year membership has increased, that Battle of Britain Week, appropriately in such an anniversary year, saw an unprecedented number of celebrations of every kind both at home and overseas, and a report on the progress of the Association's homes at Richard Peck House and Sussexdown, where provision of residential accommodation of the highest order for the permanently and badly disabled came into full use during the year.

In October this exceptionally lovely home was officially opened by Her Royal Highness the Duchess of Gloucester, and the Association's endeavour in this most-needed and specialised field is now working to full capacity, and the Report reflects the concern of the Council at the large and urgent need for the homely care of such cases, the call at present being far beyond the physical scope of the Association's facilities.

Some great things this Report makes very clear; the Association has accepted each new challenge as it presents itself; it has accepted and successfully overcome the financial and other problems involved; it is thriving and forward-looking, bursting with optimism and energetic enthusiasm, and it is facing an expanding future of personal service with the steadfast confidence of continued success.

After reading the Annual Report for 1965, members, friends and helpers in all parts of the world may feel justly proud of their part in bringing so large a measure of relief and happiness to so many thousands of people, all of whom have their own personal reasons for being grateful for the existence of the Royal Air Forces Association.

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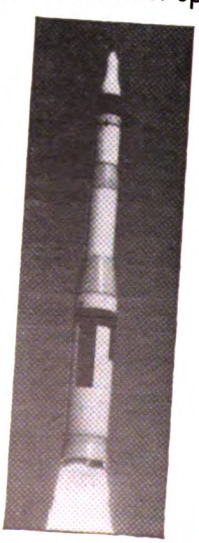

North American Aviation Autonetics Division

European Headquarters: North American Aviation S.A., 29 Rue de la Coulouvenriere, Geneva, Switzerland

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SWORDS IN THE R.A.F.

By A. F. Tinsley

IN 1919 the Air Ministry made an important decision affecting dress for Royal Air Force officers. It invited the famous house of Wilkinson Sword Limited, sword-makers to the world's Armed Forces since the early 19th century, to submit a pattern sword for possible adoption as a regulation sword for R.A.F. officers.

Since the earliest days of the Royal Flying Corps, the question of whether officers should wear swords had been a subject of much controversy. It had started when Royal Navy and Army officers began to be seconded to the R.F.C. To them, sword-wearing was second nature. They resented the idea of renouncing the sword, and steadfastly supported its retention. The "cons" in the argument included those flying pioneers who had served in neither Navy or Army and to whom the sword seemed a useless encumbrance. What on earth did men who spent most of their time flying want with swords, they asked?

Then, after the R.A.F. became a separate Service on April 1, 1918, the Air Ministry ruled that all officers would wear swords, and that they should buy their own. The order was unpopular, if for no other reason than that a sword added considerably to the already costly outlay which an officer had to make for his uniforms, and at last the idea was shelved. But the belief that the sword should become part of an officer's dress persisted, and in 1919 the pattern sword was ordered. Wilkinson Sword produced it, King George V approved it, and swords in the R.A.F. became mandatory. The sword, in design a variation of the infantry sword, with a hilt incorporating the R.A.F. insignia and with a gold eagle's-head pommel, was the same for all officers except that for those of air rank the scabbard decoration differed. Came World War II, and swords were put aside "for the duration," and it was not until 1952 that the Air Ministry decided to purchase swords for issue to officers and warrant officers, for special occasions.

Compared with its sister Services, which have had centuries in which to acquire vast quantities of silverware and other valuable trophies and regalia, the R.A.F. has not had very long, in its 48 years' existence, in which to build up a Treasure Chest. So its ceremonial swords are among some of its outstanding treasures. Most are either worn on special occasions, or presented at passing-out parades to young men who have emerged as outstanding members of their Entries.

The oldest such sword is that which Marshal of the Royal Air Force Lord Trenchard introduced in 1921, as the first Sword of Honour in the R.A.F., for presentation at passing-out parades at the R.A.F. College, Cranwell, which he had founded not long before. The custom had long been in use at Dartmouth and Sandhurst, and Lord Trenchard's introduction of a sword brought Cranwell into line with the other colleges. Since 1921 a Sword of Honour has been made for Cranwell by Wilkinson Sword for each of the three passing-out parades yearly, when the Reviewing Officer has presented the Sword to the flight cadet recommended by the College Commandant as having most distinguished himself in study, sport,

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and general influence while at Cranwell. The first Sword winner was Flight Cadet Under Officer C. L. Falconer, who later rose to high rank in a career of distinction. He received his sword on December 20, 1921, and retired from the R.A.F. as Air Commodore Falconer in April, 1949. The winners are allowed to retain the sword, which becomes a treasured possession for life.

The Sword of Honour principle was introduced at the R.A.F. Technical College, Henlow, by the Air Council in 1955, at a time when it was recognised that the promotion of technical knowledge was becoming a matter of ever-increasing importance. The sword went to the technical cadet adjudged the best all-rounder of each Entry. It was the most prized award at Henlow, but following the merger of Henlow and Cranwell last January, this sword's future is now uncertain.

Another highly prized sword at Henlow was the Norton Sword, for the outstanding University Cadet of each Entry.

The sword was presented by Group Captain F. A. Norton, C.B.E., who for over 3 years, from 1928, was Chief Instructor at Henlow. When some 20 years later, cadet status was granted to students at that Technical College, he presented his own sword as an inducement to cadets to give of their utmost. Group Captain Norton retired in 1954 and is now living in Durban, S. Africa.

Some years ago the Argentine Air Force presented a sword to the R.A.F., to be awarded annually to the graduate at either the R.A.F. College, Cranwell, or the R.A.F. Technical College, Henlow, obtaining the best aggregate marks during the year. It is a replica of the sword used by General Jose San Martin, 19th-century liberator of Peru and Chile from the Spanish yoke.

Unquestionably the most magnificent sword in the Royal Air Force is that worn on all ceremonial occasions by the Chief of the Air Staff. On December 17, 1959, Mr. V. P. Gentry, Prime Warden of the Goldsmiths Company, presented a ceremonial sword to the then C.A.S. — Marshal of the R.A.F. Sir Dermot Boyle — as a symbol of the admiration and gratitude of one of Britain's most ancient City Guilds for the newest Fighting Service. It was to be worn by Sir Dermot and succeeding Chiefs of the Air Staff. It was designed by Mr. Eric G. Clements of King's Norton, Birmingham. Its hilt and goldsmith work are by Padgett and Braham Ltd., of West London, and the blade by Wilkinson Sword Limited. The whole design includes, where suitable, a Royal Cipher and the R.A.F. crest.

The sword is of the light rapier type with a straight blade of tempered steel and a simple loop knuckle guard. The pommel is a sphere engraved and decorated with translucent enamel representing the world enclosed in a spherical cage of three gold bars formed in a spiral pattern, the whole surmounted by a Royal Crown. The grip is of silver decorated with oval recesses, each set with a small gold bar. The knuckle guards are carved strips of silver engraved with a recurring V-shaped motif suggesting flight and bearing the Royal Cipher, surmounted by a Crown and the R.A.F. Crest, both cast, pierced and mounted in low relief The circular finger-guard or shell has on the upper face a decorative treatment of the Northern, and on its lower face of the Southern Hemisphere, important constellations being applied

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in gold and engraved on to the silver sky. The steel blade is etched with a recurring obelisk shape motif, in each panel of which will be etched the surnames of successive Chiefs of the Air Staff and the year of taking office. The inscription, "Per Ardua ad Astra". is etched towards the point on one side.

The two scabbard mounts are of silver gilt engraved with the same motif as the knuckle guard. The Chape is in plain silver gilt. The two intervening spaces are of plain morocco leather in R.A.F. blue. The sword, presented at the Goldsmiths Hall, Cheapside, on December 16, 1959, is kept, when not being worn, in a case in the office of the Chief of the Air Staff.

The R.A.F. College, Cranwell, is a place of many beautiful trophies, some of them acquired from far across the seas, as in the case of the lovely steel sword which hangs in the Cadet Wing. A symbol of friendship between the two organisations, it was presented in June, 1963, by a visiting party of senior cadets from the United States Air Force Academy, to the senior flight cadets at Cranwell.

At each passing-out parade at the Officer Cadet Training Unit at R.A.F. Feltwell, Norfolk, and indeed, since there was an O.C.T.U. at R.A.F. Millom, Cumberland, in 1952 - 53, a Sword of Merit has been presented to the officer cadet gaining top marks in his course in officer qualities. It is another example of a senior officer's desire to give something to the Service which would inspire young men to do well for the sake of the Service. The sword was owned by Air Chief Marshal Sir Leslie Hollinghurst who had been commissioned in the R.A.F. on April 1, 1918, and who retired in December, 1952. It was first presented five days before his retirement, on December 22 that year, at the passing-out parade of No. 1 Officer's Initial Course at Millom. Shortly afterwards the Millom O.C.T.U. moved to Jurby, Isle of Man, to become part of the O.C.T.U. there, which was to remain at Jurby for the next 10 years before moving to its present base, R.A.F. Feltwell.

There is one ceremonial sword in the R.A.F. which appears only once annually, when it is carried by the Fighter Command Ensign Bearer at the annual Battle of Britain Thanksgiving Service at Westminster Abbey. Known as the "Monypenny Sword", and retained at R.A.F. Stanmore Park, the sword was owned by Squadron Leader J. B. S. Monypenny, a bomber pilot killed in action in 1940.

At the Chapel of Remembrance at R.A.F. Biggin Hill, among the reminders of the Battle of Britain three swords affixed to the baptismal font, and presented by the Royal Air Forces Association in 1957, have a three-fold significance. They represent the three swords which form the central motif of the R.A.F. Biggin Hill Badge; they are emblematic of the Sword of the Spirit; and they symbolise the "Crusaders of Freedom", the Battle of Britain Pilots who flew from Biggin Hill.

The three original swords were discovered in a West End antique dealer's shop by Wing Commander P. D. Thompson when he was commanding Biggin Hill. Each bore a Sudan armourer's mark and was of mediaeval European pattern. Early last year one of the swords was stolen, and on learning of the loss Wilkinson Sword produced an exact replica of the stolen weapon and on December 7 Major John Wilkinson Latham, director of the firm, presented it to the chapel.

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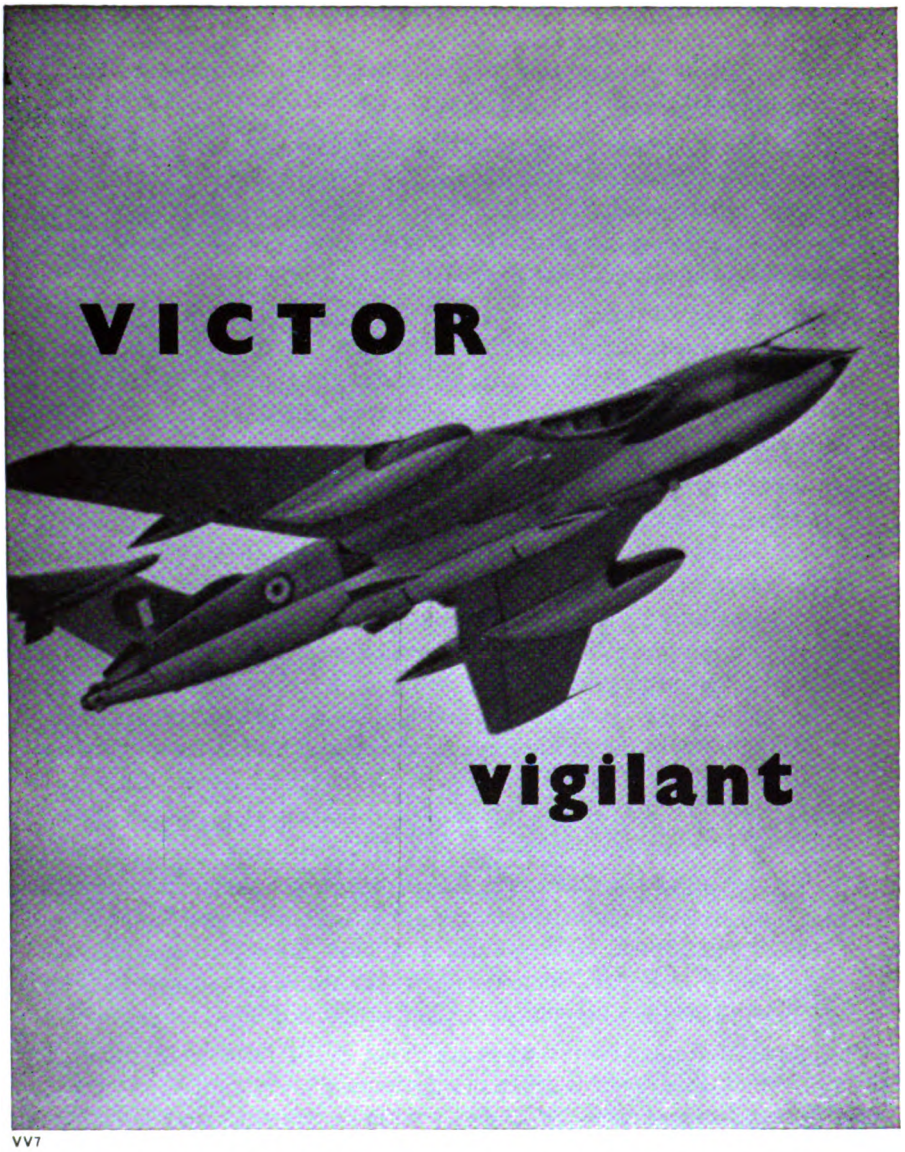

VV7

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"TO ROME ON A TANDEM"

By Kate Fisher

THE old men playing "boules" in Avignon railway-station looked up curiously as Pat and Joe cheered. The scarlet-painted 15-year-old tandem which was to carry the boys 630 miles to Rome was emerging from the train at last. It had been held up in Paris for two days, during which time the two young British Air Force cadets had been impatiently kicking their heels in Avignon.

As they wheeled the bicycle past the old men and out into the mistral-chilled December air, they became conscious of the weight they would have to push. The load consisted of two sleeping-bags under the handle-bars, a tent on the cross-bar, groundsheets, saddle-bag and two panniers filled with changes of clothing, food and countless socks on the back.

The project which the two 19-year-old boys were undertaking was partly financed by a £50 award from the Trenchard Memorial Scheme which encourages Service personnel to carry out expeditions on their own initiative. To this amount Pat and Joe added £50. Train fares and insurance cost £60. They spent £8 on equipping the tandem, tyres, first-aid kit, etc., and £20 on food including rations taken with them and meals bought en route.

Pat was quarter-master, cook and mechanic. Joe, as navigator, supplied maps and acted as accountant. Their project, beginning in England and ending in Rome, was to take from 7th to 17th December.

Pleased to be on the road at last, they soon attained a steady cycling rhythm. Travelling south at 20 m.p.h., Pat and Joe reached their first stop, Salon, at 4 p.m. with light growing short.

They pitched their tent in a field and Pat soon had hot soup and omelettes ready. Their stove worked perfectly throughout the journey. Packing away neatly into a dried milk tin, it was fuelled by petrol, a small plastic container of which was sufficient for ten days. Although plentiful and cheap, the boys only used camping-sites twice during the eight days travelling. Beaches and fields made the most convenient pitches. Here they cooked meals at 9.30 a.m. and before they turned in at night. Often the travellers were too weary to look round in the evenings. They went to bed early, piling on extra clothing for warmth.

The daytime temperature was good, seldom below 60 degrees F. The cadets cycled jacketless. The only rain they met was in England on the first and last days of their journey.

Pat and Joe took four days cycling through France, averaging 60 miles daily. The coast road from Marseilles to Menton was easily followed, the most enjoyable stretch being from St. Tropez to Menton. The weather was balmy, amid pleasant surroundings of orange trees, palms and cacti.

Unfortunately, Pat got a chrome splinter in his finger after three days' travelling. The consequent pain and swelling hampered their progress. They were having a breather to rest Pat's hand in Nice, when the two came across "The Red Awning",

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a cafe five yards from the sea-front. The English name drew them inside. The charming French proprietress, recognising them as British, produced a packet of "Typhoo", and brewed them a welcome pot!

The following day, Sunday, December 12th, the boys were meandering through Monaco, admiring the clean tall buildings rising up from the water-front backed by mountains. Suddenly they were halted by a picturesque policeman. Suspicious of their beard-growths, unkempt attire and the extreme age of the tandem, which, incidentally, behaved perfectly throughout their travels, he took the boys' particulars. On discovering they were mad Britishers, and not vagrants, he became more friendly and let them proceed.

The roads were becoming hilly. Frequently the cadets had to get off and push because of their weighty equipment. On a steep hill down into Menton, they lost control ending up in a heap in a field. Otherwise they had few spills.

Over the Italian border, the journey became more arduous. The roads were favourable, but Italian taxi-drivers were a menace, and ox-carts impeded progress. Two days travelling brought them to the sleasy water-front and docks of Genoa. Here Pat and Joe were instructed in the correct method of eating spaghetti, fork rolled into spoon. After washing this down with a carafe of sweet white vino, they trudged on to a near-by camping site. Both boys were saddle-sore by now, and despite nightly doses of liver-salts were suffering from the effects of greasy food. However, after a night's sleep, they pushed on to Sarzanio, a further 60 miles.

Over their evening meal, they calculated that, because of time wasted in Avignon, and their inability to maintain the 75 miles daily hoped for, Rome could not be reached in the allotted time. They decided to press on to within 100 miles of Rome, finishing the journey by train.

Covering a further 100 miles in two days, they paused just long enough in Pisa to appraise the Leaning Tower, and arrived at Venturina on December 16th.

They entrained for Rome that evening, arriving in the early hours. Straightway the tandem was unloaded and despatched to Dover. It was to suffer more man-handling by the Italian railway staff then, than it had received during its 520 miles on the road.

A quick nap, and Pat and Joe somewhat hurriedly explored Rome. They spent an hour in St. Peter's, Vatican City, wondering at the Popes' coffins in the vaults, and shooing off dozens of cats in the catacombs. In an old-type Trattoria, beside the new-type Roma Termini, they ate pizza pie.

Immediately, then, they caught the 2.20 p.m. train for Calais. There followed a nightmare journey, standing without food for twenty-six hours. Their troubles were no lighter when they embarked from Calais to Dover at 4.30 p.m. A force nine gale was raging in the Channel. Everyone was sea-sick and soaked.

The two adventurers plus tandem arrived home late on December 17th. They were thinner, weary, filthy and hungry but jubilant. The project, they said, had, apart from the last hundred miles to Rome, been successful. But please — could they have food, bath, and bed — in that order?

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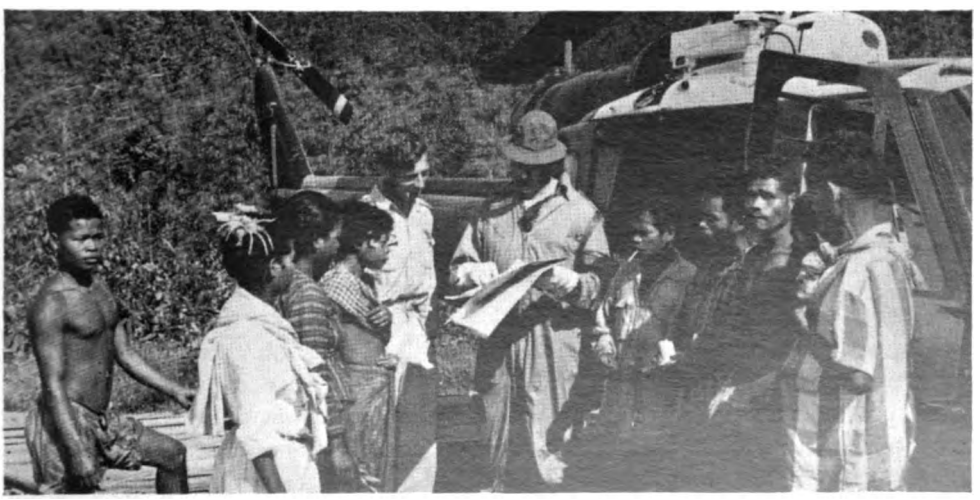
Jungle Helicopter Doctor

By Squadron Leader W. Smither, D.F.C.

R.A.A.F. helicopters in Malaya are helping to bring medical care to aborigines in inaccessible country in Malaya. Operating Malaya's own flying doctor service, they are making it possible for the Malayan Aborigines Department doctor to provide regular care to primitive people cut off from outside help.

Once a month, an Iroquois helicopter with a pilot and crew man aboard, takes off from R.A.A.F. base, Butterworth, and picks up Dr. Malcolm Bolton from a jungle medical post, and for the next three days flies him to isolated settlements within an area of hundreds of square miles of Malaya. The aborigine huts, of woven bamboo and attap, are tucked in amongst the jungle vegetation, making the job of pinpointing the area doubly difficult.



***The pilot of the Iroquois**, Flight Lieutenant H. S. Rees, of Adelaide, SA, (in flying suit) **checks with Dr.** Bolton the next point of call, watched by interested aborigines.*
(Royal Australian Air Force, P.R. Photo)

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Dr. Bolton, an Englishman who has worked with the Aborigine Department for the past fifteen years, says that the flying doctor service as it is now, is a natural evolution from the days when he used to fly in by light aircraft to tend Malay police field force men who were in the jungle fighting Communist terrorists. After the Malayan emergency, the service was extended to cover the aborigines, and eventually helicopters made it possible to land at prepared clearings in many more areas.

Only pilots fully trained in jungle operations could handle the flying doctor missions. From the air the jungle spreads in every direction. Only the glimpse of an occasional muddy river and odd-shaped mountain peak breaks the monotony of grey-green trees, covering every foot of the mountainous country. Map reading skill, and familiarization with the area, enables the crew to progress from one landing zone to the next, often along valleys with mountain peaks rising high on each side of the tiny 'chopper'. After taking off from one settlement the pilot calls by radio to a central radio control and gives his position and his next destination. Should he not call for thirty minutes, he can expect an air search to be mounted.

Dr. Bolton has been flying in the area for so many years that he is invaluable as a guide, and with a headset he talks to the pilot during the flight, often saving valuable flying time by helping to determine a new position.

The aborigine department has established medical orderlies at about half the settlements. These men, local aborigines, are trained at the department's hospital at Gombak, near Kuala Lumpur, in first aid and medical care. They become the doctor's representative in a settlement, working from a government medical post, constructed like the rest of the village, from local materials. With a stock of medical supplies they are able to maintain rudimentary health care among the villagers. About half the posts are connected by pedal radio to the Gombak hospital, and should a patient need urgent medical aid, a call on the radio would bring the doctor by air within a short time. The same aircraft or helicopter would be used to evacuate the patient if necessary.

R.A.A.F. crews are full of praise for Dr. Bolton. In the three days he is airlifted by Iroquois he visits up to 60 medical posts, and appears to be tireless. Because the three-day operation takes the helicopter well away from Butterworth, the crew and the doctor spend two nights as guests of the Malayan police field force, who maintain posts throughout the jungle. Very often, while the weary crews are relaxing at night, enjoying the company of the police group, the doctor will take a walk through the jungle to a nearby village, and spend the evening discussing their medical and social problems. Conditions at the posts are far from first-class, and helicopter crews have learned to live rough. They sleep on a bamboo pole bed, wrapped in a spare supply-drop parachute, after a supper of hot Malay curry and rice. In the morning they might wash and shave standing waist-deep in a cold mountain stream, before setting off early for the next settlement.

Despite this, competition for the chance to fly the doctor is keen, with squadron ground crews also eager for the chance to share the experience, and to take part in such a worth-while project.

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NEW IMAGE AT 128, PICCADILLY

THE Royal Air Force Club is almost as old as the Service itself. The first Committee was formed under the Chairmanship of Lieutenant General Sir David Henderson just six months after the Royal Air Force was born. The Club took temporary root in the Bruton Street quarters of the old Royal Flying Corps Club which had ceased to exist on the expiry of its term of endowment in December, 1918. The exceptionally fine premises which today stand overlooking Green Park at 128, Piccadilly, were opened three years later on 2nd January, 1922.

The Club owes its existence to the great generosity of the first Viscount Cowdray. Lord Cowdray had been president of the Air Board in 1917 and, when the R.F.C. Club closed down, he offered £100,000 to endow and equip a worthy Service Club to stand as a memorial to his own son killed on the Western Front and to the airmen of the first World War for 'their brilliant and superlatively heroic work'. Altogether Lord Cowdray gave £250,000 for the Club building and a further £100,000 for fittings and furniture—an immense sum of money in 1918—and was elected the Club's first President. The first Club Committee boasted the names of Lord Weir, the then Secretary of State for the Royal Air Force, and three other members of the Air Council—Major J. L. Baird, M.P. (PUS of S), Major-General W. S. Brancker (Master-General of Personnel) and Major-General Sir Godfrey Paine (Inspector-General of the R.A.F.). The social life of the infant Royal Air Force revolved around Bruton Street and Piccadilly and the Club thrived.

Since the war the Service has redeployed and there have been vast social changes. The old fighter stations which surrounded the metropolis— household names in the

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Battle of Britain— have gone. And gone with them the vibrant life these Squadrons brought to town. The Royal Air Force is now widely dispersed well away from London, and the younger officers, hedged in by economic pressure and the demands of modern Service life, understandably saw little purpose in committing themselves to the slightly old-fashioned concept of the pre-war London club. With the younger generation particularly, the traditional idea that membership of a West End Club was somehow synonymous with social standing is dead. Membership became a simple exercise in cost-effectiveness and the Club came out on the wrong side of the equation. The inflow of new blood and ideas from the modern Air Force dwindled. Lord Cowdray's splendid vision of a Club worthy of a great Service seemed doomed in a dying anachronism finally to be lost in the dust of demolition.

Yet the Club belongs to the Royal Air Force and the Service was not prepared to see its heritage go by default. Tradition is excellent but when it defies logic change must come. Within the Service the concept of the Officers' Mess is already changing from the old idea of the traditional and sacrosanct bachelor home to that of a modern social club which is the focus of station life. So must our own Service Club change. In a Service-wide poll at least 75% of all officers were in favour of a Royal Air Force social centre in London modern in ideas and outlook. The present Committee is determined that this shall be so. 128, Piccadilly must become a focus of R.A.F. life in London where serving and retired officers, both ladies and gentlemen can meet husbands, wives and friends in a relaxed atmosphere without the old-style barriers which existed in an all male preserve.

To be successful the Club must be a partnership between those who serve and those who have served and it has been most gratifying and encouraging to have wholehearted support for the new image from the older Bruton Street members. Without exception they have given their blessing, understandably with a word of caution here and a word of advice there, but all wholeheartedly behind the single aim of ensuring the success of a new modern and vigorous Royal Air Force Club.

There is a very great deal to be done and great changes cannot be wrought overnight. By the time this appears in print Club administration will have been overhauled and streamlined and Club management will be in the hands of a General Manager, an experienced hotelier and restaurateur. A start will have been made on improvements to the central heating system, bathrooms refurbished, more double bedrooms made available and some Club facilities repositioned and improved. For the longer term projects such as a bar for younger officers and their ladies are wholly desirable, but for these and similar schemes time, money and effort will be needed. In the meantime this must not be a one-sided campaign. Support for the Club must not begin and end, like a charity flag day appeal, with the annual payment of a subscription. Stonework and fine furnishings do not make a Club except there is a throbbing and vigorous life inside. We can all help to give it that life— private functions, squadron parties and branch reunions. In this way we keep faith with those who, almost fifty years ago, provided a Club worthy of the Royal Air Force, and thus hand on to our successors a strong and thriving heritage.

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AIR OFFICER APPOINTMENTS
ROYAL AIR FORCE

MINISTRY OF DEFENCE (AIR)

AIR MARSHAL R. H. E. EMSON, C.B., C.B.E., A.F.C., as Deputy Chief of the Air Staff — April/66.

Educated at Christ's Hospital and R.A.F. College Cranwell. After flying with bomber squadrons and on reconnaissance duties with the Fleet Air Arm until 1935, he became an armaments specialist, in which duties he served at H.Q. Fighter Command, the Ministry of Aircraft Production and Central Fighter Establishment during the war.

Then he was Chief Instructor at the Empire Air Armament School, Command Armament Officer M.E.A.F., Deputy Director of Operational Requirements Air Ministry, Director of Armament (Research & Development) Ministry of Supply, Air Attaché Washington and Assistant Chief of Air Staff (Operational Requirements).

AIR MARSHAL SIR DONALD EVANS, K.B.E., C.B., D.F.C., as Air Secretary — July/66.

Educated at Wellington and R.A.F. College Cranwell. After serving with No. 45 Squadron, M.E.A.F., he joined Fighter Command shortly before the war. In 1941 he commanded an interception unit engaged on night-fighter trials; in 1942 was awarded the D.F.C. after destroying two enemy aircraft. From Group Captain in charge of night operations at No 11 Group, in 1943 he served in Mediterranean Air Command, engaged upon air signals planning for the Sicily invasion. He was similarly employed with the Allied Expeditionary Air Force for the Normandy landings.

After the I.D.C. course in 1956, he was S.A.S.O. Fighter Command 1957-58, commanded School of Land/Air Warfare 1959-61, when he became Assistant Chief of Defence Staff. Since January, 1964, he has been the Air Officer Commanding-in-Chief Technical Training Command.

AIR VICE-MARSHAL L. D. MAVOR, C.B., A.F.C., as Assistant Chief of Air Staff (Policy and Planning) — March/66.

Educated at Aberdeen Grammar School and Aberdeen University, he entered the R.A.F. College Cranwell in 1935. In 1938 he was posted to No. 31 Squadron in India and in 1941 took part in flying reinforcements to Iraq during the revolt. In 1944 he joined No. 147 Squadron, Transport Command, primarily employed in supplying the liberation forces in Europe.

In 1945 he became Chief Instructor at one of that Command's operational training units. 1956-58 he was on the Directing Staff at the R.A.F. Staff College; then took the course at the R.A.F. Flying College. In 1959-61 he commanded the Bombing School at Lindholme. Since January, 1965, he has been the Air Officer Commanding No. 38 Group.

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THE ROYAL AIR FORCE BENEVOLENT FUND was founded in October, 1919, by the late Viscount Trenchard to secure lasting benefits for the personnel of the Flying Services and their dependants in commemoration of their achievements during the Great War 1914-18.

A Memorial to the Officers and Men who lost their lives stands on Victoria Embankment overlooking the Thames, and was unveiled by H.R.H. The Prince of Wales in July, 1923. An inscription, in remembrance of those men and women of the Air Forces of every part of the British Commonwealth and Empire who gave their lives in the 1939-45 war, was unveiled by Marshal of the Royal Air Force Viscount Trenchard at a ceremony on 15th September, 1946.

The Fund exists for the relief of "distress" or need, actual or potential, among past and present members of the Royal Air Force, Royal Auxiliary Air Force, Royal Air Force Reserves, Women's Royal Air Force—and their dependants. It must, therefore, be prepared to help:—

The disabled, and the dependants of those killed flying.
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Expenditure on all forms of relief amounts annually to about £700,000. In the first year of the Fund's existence, 1919-20, it is noteworthy that the help given amounted to £919, and since then, a total of nearly £13 million has been disbursed on all forms of assistance. Of this amount over £12 million has been expended since V.J. day, 1945.

The Royal Air Force Benevolent Fund exists for a Service that trains as well as fights in the air, and provides relief not only for cases arising from casualties in war, but also for those arising from flying accidents and ordinary distress in peace. It must therefore be prepared to render help indefinitely, and not merely to meet temporary emergencies.

The Council trust therefore that the Service and general Public will respond generously and unremittingly to their appeal, and so enable the Fund to continue its increasingly valuable work.

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Contributions, which will be gratefully received in the form of donations, annual subscriptions, Deeds of Covenant, or bequests including shares, land and house property, should be sent to:

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TECHNICAL TRAINING COMMAND

AIR MARSHAL W. E. COLES, C.B., C.B.E., D.S.O., D.F.C., A.F.C., as Air Officer Commanding-in-Chief Technical Training Command — May/66.

Born at Banbury, Oxon. He joined the R.A.F. in 1938. He had a distinguished war time flying career; mainly as a specialist on air-supply dropping. During 4½ years in the Mediterranean, Far East and Europe he completed more than 300 missions. He flew with No. 216 Squadron in the Western Desert, making the first night-bombing attacks on Italian targets, in addition to transport-support duties and "Cloak-and-dagger" missions.

In 1943 he commanded No. 117 Squadron during the Italian campaign and later went to the Far East for supply work with the Chindit columns. On D-Day he commanded No. 233 Squadron during the Normandy landings and later flew glider-towing and supply-dropping missions at Arnhem.

Since the war he has served at the Air Ministry, C.F.S. and as Air Adviser to the High Commissioner in Australia. After the I.D.C. course in 1957, he was S.A.S.O. No. 3 Group and in 1960 A.O.C. No. 23 Group. Since September, 1963, he has been Director-General of Personal Services at the Ministry of Defence (Air Department).

MAINTENANCE COMMAND

AIR MARSHAL M. K. D. PORTER, C.B., C.B.E., M.I.E.E., F.R.Ae.S., as Air Officer Commanding-in-Chief Maintenance Command — July/66.

1928 enlisted in the R.A.F. as an aircraft apprentice and in 1930 was awarded a cadetship to the R.A.F. College, Cranwell. In 1932 he was posted to No. 2 Squadron and in 1934 to No. 824 (Fleet-Spotter-Reconnaissance) Squadron, flying Fairey III F's from H.M.S. "Eagle" in the Far East. After a specialist course he returned to No. 2 Squadron as Signals Officer.

In 1939 he was posted to R.A.F. Balloon Command as Chief Signals Officer and in 1940-42 was Chief Signals Officer at No. 11 Group. In 1943 he was Chief Signals Officer 2nd Tactical Air Force and in 1945 held a similar post at Bomber Command.

After replanning the R.A.F. Technical Branch in 1946, in 1947 he became a member of the Directing Staff at the R.A.F. Staff College. In 1950 he was appointed S.T.S.O. of No. 205 Group, M.E.A.F. During 1952 and 1953 he commanded No. 2 and No. 1 Air Signallers Schools and in 1954 was posted as Chief Signals Officer to 2nd T.A.F. Germany. He was appointed Chief Electronics Officer at Fighter Command in 1955.

After attending the 1959 I.D.C. course, he was Commanding Officer R.A.F., St. Athan, and Air Officer, Wales. In 1961 he was posted to the Ministry of Defence (Air), firstly as Director-General of Ground Training and in 1963 as Director-General of Signals.

RETIREMENTS

AIR CHIEF MARSHAL SIR WILLIAM MACDONALD, G.C.B., C.B.E., D.F.C., A.D.C.

AIR MARSHAL SIR NORMAN COSLETT, K.C.B., O.B.E., M.I.Mech.E.

AIR COMMANDANT DAME JEAN CONAN DOYLE, D.B.E., A.D.C.

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Book Reviews

The Royal Flying Corps, a History, by Geoffrey Norris (Frederick Muller Ltd., London; 256 pp.; illustrated; 30s.).

This is a unique book in several respects. It concentrates entirely on the history of the Royal Flying Corps, from its formation on May 13, 1912, until it was absorbed into the Royal Air Force on April 1, 1918. It loses interest in the former Naval Wing of the R.F.C. when this Wing becomes the subject of an Admiralty U.D.I. on June 23, 1914. Nor does it devote much space to the happenings in the air after the formation of the R.A.F. Such single-mindedness enables the author to pack a detailed, readable and competent history into a single volume that is a "must" for every serious aviation reference library. But, viewed in such isolation, it is not easy to put the R.F.C. into true perspective *vis-à-vis* the R.N.A.S., other Allied air forces or the enemy.

To a large extent, as Sir John Slessor points out in his Foreword to the book, "In the great, grim siege that was the Western Front the R.F.C. was an ancillary of great and increasing importance — but an ancillary. Its primary job remained reconnaissance and observation for the guns and that it did, on the whole, extremely well, undeterred by heavy loss." This is a basic fact of aviation's first major war that is usually overlooked by the current generation of air historians, who are more attuned to modern concepts of independent air power.

All too often it is forgotten that the fighter aircraft was born primarily to shoot down enemy reconnaissance aircraft and to prevent enemy fighters from shooting down the reconnaissance machines that were its job to protect. Seen in this light, one gains a new idea of the seriousness of the "Fokker Scourge" of 1915-16. It was bad enough that German Fokker monoplanes were shooting the R.F.C.'s B.E.2C's from the sky. Far worse was that, in doing so, they threatened to rob the Allied armies of the "eyes in the sky" that were so vital to them.

Another unique feature of this story is that it tells of a kind of warfare that had hardly been known since the age of chivalry. Take, for example, Mr. Norris's account of what happened after Second Lieutenant C. R. McCubbin, flying an F.E.2B, brought about the death of the legendary Max Immelmann, greatest exponent of the Fokker monoplane:

"It was characteristic of the fighting pilots of that time that British pilots should drop a message over a German airfield, extolling Immelmann's prowess and asking whether an aircraft from 25 Squadron could make a formal fly-past at the funeral. A return message from the German's indicated that they were agreeable providing the aircraft carried no armament. This honour to an enemy was duly performed by Lieutenant 'Fluffy' Dixon."

Clearly, Mr. Norris dug very deeply to find the wealth of good stories for this book; only the occasional misspelling, and even rarer factual error, detract from its complete enjoyment by the better-informed reader. Examples are "Frank Gooden" instead of "Goodden" with two "d's", "De Haviland" for "de Havilland" and the suggestion that the D.H.9 was "a bigger and better version of the D.H.4" when it was in fact a disastrous development of its illustrious predecessor.

Chapter Twenty ends with the reminder that by the time the Royal Air Force was just twenty-five days old it had already lost its first Chief of Air Staff (Trenchard), the Vice-President of the Air Council (Sir David Henderson) and another member of the Air Council (Sir Norman Brook), as well as the Air Minister, Lord Rothermere, through their inability to work together. Knowing in retrospect how wonderfully the R.A.F. developed despite such dissentions, our naval friends may be encouraged to think that the Royal Navy will survive the resignations that followed publication of our 1966 *White Paper on Defence*!

J.W.R.T.

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9 Squadron, by T. Mason (Beaumont Aviation Literature, 11 Bath Street, London E.C.1; 113 pp.; illustrated; 22s. 6d.).

Time was when squadron histories were either beautiful hand-lettered, leather-bound, one-off tomes in an officers' mess or a handful of duplicated sheets stapled together. Now, thanks to dedicated types like Flying Officer Mason, it is becoming possible for anyone to buy really detailed, accurate and highly-interesting histories of some of the R.A.F.'s most famous squadrons in a form which enhances the bookshelf without too serious an effect on the wallet.

It was back in 1960 that we first heard of Flying Officer Mason. At that time he was serving with No. 12 Squadron and gave us a concise and highly-readable record of the activities of this famous unit, illustrated with photographs which, in many cases, had never before been published. To their credit, the Air Ministry subsequently posted Mason to No. 9 Squadron, where he immediately set to work on this second book. There must now be a large number of enthusiasts who hope that he will, in time, become the most-travelled officer in the Service, as a series of these books would form an unrivalled tribute to the men and machines that made the R.A.F. the envy of, and model for the world for so many years.

Every page of *9 Squadron* contains something new. Take, for instance, the priceless story of the Squadron's badge, evolved in 1927. At that time, No. 9 was equipped with Virginia night bombers; so it was decided to use a bat as the basis for the design. Many rounds of twelve-bore ammunition were expended before a model was produced for the artist. It was next decided to adopt as the Squadron motto the Latin text *Per Noctem Volamus* — "We Fly by Night". This prompted the C.O. of 58 Squadron to enquire; "What do you by day — sleep?"

One wonders how Flying Officer Mason finds time to fly, sleep and write such superbly—detailed books, which benefit greatly from the fact that they shun cheap sensationalism, Stories such as these do not need elaboration and one can only ask, like Oliver Twist, for more, please.

J.W.R.T.

Military Transports and Training Aircraft of the World, by F. G. Swanborough (Temple Press Books, London; 120 pp.; fully illustrated; 30s.).

This is the fourth book in the uniform series that already includes *Combat Aircraft of the World, Turbine-Engined Airliners of the World* and *Vertical Flight Aircraft of the World.* In some respects, the types of aircraft that it describes and illustrates in great detail are less exciting than those covered by the earlier volumes. For this reason it is, perhaps, the most valuable book in the series, because these particular aircraft have not been "written to death" by other authors.

Everyone knows what a Lightning, Mirage or F-111 looks like; but how many readers of this journal could identify a picture of the Dinfia Huanquero, I.A.F. Kanpur or Neiva L-6 Paulistinha?

Of course, this is by no means entirely, or even mostly a book about little-known military aircraft. Far more attention is paid to important types like the Gnat, Hercules and Belfast, each of which is allocated two or three large pages and up to nine pictures, covering different versions where necessary. The facts and figures are as accurate as one would expect from such a highly-respected author, and go into quite amazing detail. One can discover, for example, that the Greek Air Force has a Grumman Gulfstream for executive transport duties — something that the reviewer has never seen reported anywhere else — and that the Helio U-10 is being used for operations reminiscent of the "Moonstrike" sorties by black-painted Lysanders of the R.A.F. over occupied Europe in World War II.

Such facts may seem less important than the performance figures for the Phantom II, or the development story of the Vulcan and Victor, to be found in other books in the series. However, without the types of aircraft covered in this book, the combat types would lack crews to fly them, equipment to keep them serviceable and speedy aid in emergencies.

J.W.R.T.

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Specially drawn for the RNLI by Eric Fraser FSIA

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Down to the Sea — A Century of Oceanography, by J. R. Dean, with an Introduction by Dr. Jacques Piccard (Brown, Son, & Ferguson, Glasgow; 127 pp.; 15 plates and 5 figures; 42s. net).

Our regular readers will remember this authors articles in the "Royal Air Forces Quarterly" in 1964; "OCEANOGRAPHY AND THE R.A.F." in the Summer number and "THE FIRST DIVE OF THE MESOCAPH" in the Winter issue.

Now his new book "DOWN TO THE SEA" provides a complete history of the fascinating study of Oceanography, with full details of its progress from the time of the Phoenicians to the present day. No book of this kind has hitherto been available.

Of particular interest are the deep sea scientific studies of Prince Albert I of Monaco, made almost every year between 1885 and 1915. His achievements in dredging zoological specimens from a depth of 20,000 feet remained unequalled for over 50 years.

Possibly better known, before the publication of this book, were the achievements of Professor Piccard, the first to reach the great height of 17,000 metres in the stratosphere, enclosed in a sealed cabin attached to a hydrogen filled balloon. This cabin, invented by the Professor, was the forerunner of the pressurised cabin used in aircraft today.

Later, turning his attention to the hydrosphere, he constructed the revolutionary submersible that could dive to any depth in the oceans of the world — as was proved on 23rd January, 1960, when his son Dr. Jacques Piccard piloted the bathscape *Trieste* to the bottom of the seven mile deep Challenger Trench in the Pacific Ocean.

Meteorology and Oceanography are closely allied and who could be more qualified than the author to write the history of the latter than Mr. Dean with his long study of this subject and his qualifications as a Meteorological Officer, in which capacity he served in the Coastal Command of the Royal Air Force.

The scientific studies of Oceanography have made data available which is of the utmost value to the air forces of the world in navigation, ocean currents and many other ways helpful to today's aviators.

The probing of the hitherto unknown depths of the oceans offers fascinating reading, with its many discoverys of life on the deepest sea-beds and the astonishing fact that bodies thousands of feet below the surface do not decompose. The potential wealth of minerals of all kinds on the bed of the oceans, makes one realize the immense possibilities of further explorations of the deep. A.H.S.

The Invasion of Europe — The Story Behind D-Day, by Alan A. Michie (Allen & Unwin, London; 204 pp.; 30 illustrations; 24s. net).

Alan Michie was appointed to General Eisenhower's forward Headquarters in England to report how and when the D-Day decision was made.

In this book he tells the story of the developing strategy that led to the momentous events of June 6th, 1944, and the awe-inspiring decisions that brought them about.

After summarizing the long years of defeat and retreat, he tells of the selection of the team of invasion commanders, the troops that would participate and the task of planning the greatest triphibious operation ever attempted.

During the 22 years that have passed since the Normandy landings, there have been numerous individual accounts adding colourful detail to the official history of the Allies invasion of Europe. In the latest of these books "THE INVASION OF EUROPE" there are many new and interesting details which have not hitherto been published, which will interest all students of military history.

Alan Michie, a widely experienced war correspondent and author of several highly successful wartime books for a time specialized in reporting the war in the air. His account of the air forces participation in the very momentous events of the invasion will be of particular interest to the members of the Royal Air Force. A.H.S.

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Pilots are chosen from applicants who hold Master's Ocean-going Certificates; so the men appointed bring to their duties wide experience. When John Radford entered the Pilotage Service he had been at sea for nearly twenty years, sailing all over the world in the Merchant Navy. Being also a trained officer in the Royal Naval Reserve, he knew the work of the fleet at sea, the thrill of night-firings in battleships, the excitement of tactical manoeuvres in destroyers.

During the Second World War he served in an armed merchant cruiser protecting convoys from U-boats, and later became Fleet Compass Officer at Scapa Flow. (Here occurred the adventure of the spy who tried to kill Churchill.) Retiring from the Royal Navy as a Commander, he returned to full-time pilotage in 1946. Today he pilots ships of every type and tonnage into Southampton Water — including the famous *Queen Mary* and *Queen Elizabeth*.

PILOT ABOARD is part of his life story. In it he speaks of the ice of the Belle-Isle Straits, the steamy heat of Central America, the dust-storms of the Persian Gulf, and the country scenes of his own beautiful Isle of Wight. The cadet of 1916, firing round for round against a U-boat, becomes the senior pilot of today, bringing a deeply-laden foreign vessel, in fog, at night, safely to anchor in the crowded waters of the Solent. John Radford is a master of his profession, and an uncommonly good writer as well.

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Publishers of Blackwood's Magazine

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Airlift 1870, by John Fisher (Max Parrish & Co., Ltd., London; 166 pp.; illustrated; 30s.).

In the whole of flying history there is no other story like that of the balloon service operated by the French during the siege of Paris by the Prussians in 1870-71. Cut off from the rest of France, the authorities in the beleaguered city decided to use balloons to carry mail and V.I.P.'s over the heads of the enemy to what could only be unknown destinations in "Free France". It was a fine idea, but the supply of trained aeronauts and balloons was soon exhausted.

Undeterred, the Parisians set to work to make more balloons in a huge hall at the Gare d'Orleans. The pilot shortage was remedied by conscripting a number of gymnasts; but a least one of these gentlemen, remembering that "discretion is the better part of valour", jumped out of his balloon after bringing it near to the ground, leaving his unfortunate passengers to be whisked aloft alone as the balloon, relieved of his weight, shot upward at a smart rate-of-climb. After that, a high proportion of the new aeronauts were volunteer sailors, whose bravery and discipline underwrote the success of the operation.

One of them, named Prince, stated before take-off that he would make a great flight — "one that they will remember". He was right, poor fellow. A strong wind carried him over northern Franch, across the coast, and over the Channel, where he was last seen travelling in the direction of America, 3,000 miles away. All that was ever seen again was a mail-bag or two washed ashore on the Cornish coast.

Such tragedies were hardly surprising, as each flight out of the city represented the first test flight of the balloon and the first-ever aerial journey by the sailor-pilot. Yet, most of the 66 balloons which left Paris reached safety, carrying at least 110 passengers in addition to the pilots, some 400 pigeons to bring back messages from outside, and almost a ton of mail — 2½ or 3 million letters photographed by a technique that pre-dated our Airgraph letters of World War II and modern microfilm.

In *Airlift 1870,* Mr. Fisher tells the story of this whole unique operation in a very competent manner, set against a background of military details of the siege. In doing so, he has added a very worthwhile new chapter to popular-style aviation history.

J.W.R.T.

Springboard to Victory, by C. E. Lucas Phillips (Heinemann, London; 242 pp.; 13 photographs; 19 maps and diagrams; 30s. net).

This is the story of a scratch force of some 1,500 British and Indian troops who held at bay nearly the whole of a fanatical Japanese Division for a fortnight, at a moment of extreme crisis for the Allied cause.

Kohima was at Burma what Stalingrad was to Russia and Alamein to the desert.

C. E. Lucas Phillips has written many excellent books, among which perhaps the most well-known are "Cockleshell Heroes", "Alamein" and "The greatest Raid of All". He must have taken infinite pains to collect all the essential details necessary to provide us with this fascinating story of a glorious "Back to the wall stand", which subsequently enabled larger and better equipped forces to go forward to final victory over the Japanese.

With the Allied Air Forces in this operation were the 3rd Tactical Air Force under Air Marshal Sir John Baldwin, No. 221 Group with 9 Squadrons for Corps support, 67 and 615 fighter squadrons and 194 Transport Squadron, which squadron with 25 Dakotas and 20 aircraft of the U.S.A.F. lifted the 5th Division from Arakan to Imphal. This was the first time in history that a whole Division — horse, foot and guns — had been moved by air.

It is an absorbing book, which adds to the annals of the endurance and fighting qualities of British and Indian troops.

A.H.S.

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The Aerofilm Book of Aerial Photographs (Aerofilms Ltd., London; 318 pp.; fully illustrated; 12s. 6d.).

With the aid of this book, everyone can become an expert interpretor of aerial photographs — not, perhaps, with the same skill or important results as the wartime experts who discovered V-weapons at Peenemünde or the *Tirpitz* at Tromsö, but to a degree that will give them considerable pleasure.

For example, the writer — all too many years ago — was a choirboy in Ely Cathedral. Photo No. A92317 in this book gives a superb view of this lovely "Queen of the Fens", set in the midst of the quiet little market town. Off to its right is the Rex Cinema where one saw the first, exciting, talking pictures. Away towards the top it is possible to pick out the house in Downham Road that was home for so many years. Top right is the little field that once housed the Miles Hawk lightplane and BAC Drones of the Ely Aero Club. On the opposite page is Cottenham, with its quaintly-topped church tower .... bringing back more memories.

Whatever your interests, there are pictures in this remarkable collection of "samples" from the vast Aerofilms Library that will attract you. The Tower of London and Buckingham Palace are there for those who love London and its traditions. A31145 is a picture of a storm-damaged crop that looks rather like a furry hearth-mat. There are windmills, Roman archaeological sites, prehistoric white horses cut in chalky hillsides, modern skyscraper office blocks — all in the first 28 pages.

Hovercraft of today are contrasted with a 19th Century horse bus, "Gay Nineties" posters and a shot of Tower Bridge under Construction — these last three indicating that not *all* pictures in the Library quite reflect the title of the book! Nor is the coverage limited to the U.K. There are formidable-looking mountain peaks in Burma, the magnificent Kadhimain Mosque in Iraq, the ice-fields of the Antarctic and many more wonderful indications of how far-ranging are the camera-carrying aircraft of this British pioneering company in air photography.

Basically, this book is intended to serve as a guide for potential users of such photographs; but it is much more than a catalogue and will give delight to anyone who finds fascination in this wonderful world of ours, as seen by people who fly.

J.W.R.T.

The AT-6 Harvard, by Len Morgan and **The F-86 Sabre,** by R. J. Childerhose (Arco Publishing Co., Inc., New York, U.S.A.; obtainable in the U.K. from W. E. Hersant Ltd., 228 Archway Road, London N.6; each 64 pp.; fully illustrated; 23s. 6d.).

These are the latest in the "Famous Aircraft" series of large card-cover monographs produced by Len Morgan. As before, each book is crammed full of first-class photographs and drawings, illustrating the story of the aircraft concerned, written by a man who flew it and loved it. The feelings of the man for his mount shine through every line of text, making it a book for enthusiasts by an enthusiast. The result is satisfying for historians, nostalgic for pilots, invaluable for model-makers and of great value as reference material, as the last part of each book comprises a reprint of the complete pilot's handbook for the aircraft.

Little need be said about the subjects of these latest books. The Harvard story begins with four pages about the time when so many American pilots were being trained for the R.A.F. in Canada that "R.C.A.F." was said to stand for "Royal California Air Force." It goes on to show how this remarkable trainer eventually entered service with half the air forces of the world and even acquired guns, rockets and bombs for close-support duties in Korea and elsewhere.

(continued over)

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The Sabre, another product of the North American company, is no less famous and again there is a strong Canadian link as much of the text concerns Canadian-built Sabres and the pilot's manual reproduced at the back of the book is for the Sabre 6 version produced by Canadair.

No books convey better the thoughts, fears, joys and memories of pilots than these products of Len Morgan, and they thoroughly deserve the success they have achieved on both sides of the Atlantic.

J.W.R.T.

Small Man of Nanataki, by Liam Nolan (Peter Davies, London; 162 pp.; 25s. net).

When in Hong Kong in 1956 as a National Service subaltern, Liam Nolan heard many stories of a Japanese Lutheran minister known as "Uncle John", who did much to relieve the sufferings of those in the Hong Kong P.O.W. camp Shamshui Po; but it was not until 1960, when writing one of his many B.B.C. programmes for "This is your Life" that he encountered the subject of this book. He was so impressed by the sincerity and humility of this little man that he decided to write his story.

So much has been written of the horrors of Japanese P.O.W. camps, that this account of the heroic behaviour of the Rev. Watanabe in mitigating the sufferings of prisoners of war stands out in startling contrast.

He was called up for the Japanese Army and in 1942 was sent to Shamshui Po as an interpreter. As a Christian minister he was horrified by the brutality he witnessed. At the risk of worse than death, if he was discovered, he smuggled desperately needed medical supplies into the camp, which he delivered to the British M.O.

Although often under suspicion and frequently subjected to ruthless brutal treatment by his superiors, he managed to continue his missions of mercy without detection. How he managed to do this makes a fascinating story of one whose religious beliefs surmounted his natural loyalty to his own country.

On occasions it seemed that if he persisted he was in imminent danger of arrest, but his unwavering belief that he was doing the will of God, gave him unshakeable courage. At times, even against the pleadings of his British friends to refrain from some particularly hazardous mission, he would not be deterred.

Added to the human pathos of this story is the fate of his family. His first wife died and what happened to his second wife and one of his daughters in Hiroshima was one of the tragic ironies of the Second World War.

Sir Selwyn Selwyn-Clarke, formerly Director of Medical Services, Hong Kong 1937-47, in his Postscript to this book says the Rev. Watanabe's courage and humanity were an inspiration to so many of us in the darkest days of the war — there were several Japanese like "Uncle John". Some were tortured; some were executed — "Uncle John" would be the first to want this book about him to be a tribute to that group of humanitarian Japanese of whom he was the most outstanding.

There is no doubt that "SMALL MAN OF NANATAKI" will be of particular interest to the Royal Air Force in that many officers and men were interned in Shamshui Po. Some indirectly owe their lives to the work done by "the small man" Pastor Watanabe. A.H.S.

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LETTER TO THE EDITOR

FROM SQUADRON LEADER E. J. MCLOUGHLIN, R.A.F. (Ret.)

The Editor, Royal Air Forces Quarterly

British Columbia
Canada

Sir,

The following incident may possibly interest you: —

Some fifteen years ago I was wandering up the B.C. coast in my ancient 30 ft. cruiser and went for the night into Render Harbour, 800 miles N. of Vancouver.

It is large, well protected and boasts of a Post Office. Jack Potts was the Postmaster. In the First World War he had joined the R.F.C. as a pilot. He had as the result of a crash had to give up flying, though he retained his interest in the R.A.F. One day he said to me I want to show you my very special air force treasure.

He took me into the back office and from a cubby hole he took a small parcel which he carefully unwrapped and showed me a small book called "War in the Air", or some similar title. It consisted of about 35 pages and was illustrated in colour, showing varous types of First War aeroplanes, some showed German aircraft being shot-down in flames by B.E.'s, Vickers Gun Busses, etc. I looked through it with interest and there on the last page was the date and author's name "1917. Captain R. Saundby".

"We are pleased to publish this letter from one of our regular subscribers in distant lands, which may remind some of our younger readers of the great part played in forming our traditions by the members of the Royal Flying Corps and the Royal Naval Air Service — now, alas, a fast dwindling band of veterans." *Editor.*

AIR ATTACHÉS SUPPORT FOR "THE QUARTERLY"

In response to our request to Air Attachés,asking for their help in our efforts to increase the circulation, we are grateful to the Air Attaché of the British Embassy in Greece (Air Commodore A. F. Johnson, D.F.C., M.A.) for his very active support in obtaining to-date no less than 21 new and renewal annual subscriptions to the improved edition of this Journal.

With this most encouraging start it is hoped that, with similar support from our 44 Air Attachés in the other countries, we shall soon achieve the much needed increase in our circulation.

"The Royal Air Forces Quarterly" now has regular annual subscribers in 64 foreign countries, which is proof of the high esteem in which this representative journal of the Royal Air Force is held throughout the world.

It is hoped that its potential usefulness as an Ambassador for closer relations with the world's air forces will continue to receive the support of all our Service representatives in foreign countries. EDITOR.

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THE R.A.F. QUARTERLY HAS A WORLD-WIDE CIRCULATION

The importance of any publication can be fairly assessed by its circulation and the national status of its subscribers.

In addition to the regular subscribers in all parts of the world and those on the active and retired lists of the Royal Air Force, this Journal is available to many thousands of others in the Services through the numerous copies circulated to Officers Messes in the United Kingdom and Overseas Stations.

Among personal subscribers are many Heads of Military Services in all parts of the world, as well as at Embassies of most foreign powers.

So widely is the "R.A.F. Quarterly" known that in recent years our circulation has spread to the undermentioned 64 countries, in which we have numerous regular subscribers:—

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In addition to the serious articles by authoritative writers on the world's air power, the "R.A.F. Quarterly" contains lighter reading on matters of general interest concerning current events in the various air forces of the Commonwealth. Its even more light-hearted articles, recently introduced, is increasing our circulation among all ranks, many of whom may incidentally find their interest aroused by the articles on the development of the air power of the various nations and its potential use as a deterrent or weapon of war.

In these progressive days every educated man desires to be as well informed as possible on these matters: from "R.A.F. Quarterly" he can obtain authoritative information from the articles contributed by those who have made a life study of aircraft and the proper use of air power, providing readers with confidence in discussions on Service affairs.

The four copies issued annually of the "R.A.F. Quarterly" can be dispatched to you post free for the modest investment of 25/-. An order form is overleaf and we should welcome every new subscriber.

A. H. Stradling, Editor.

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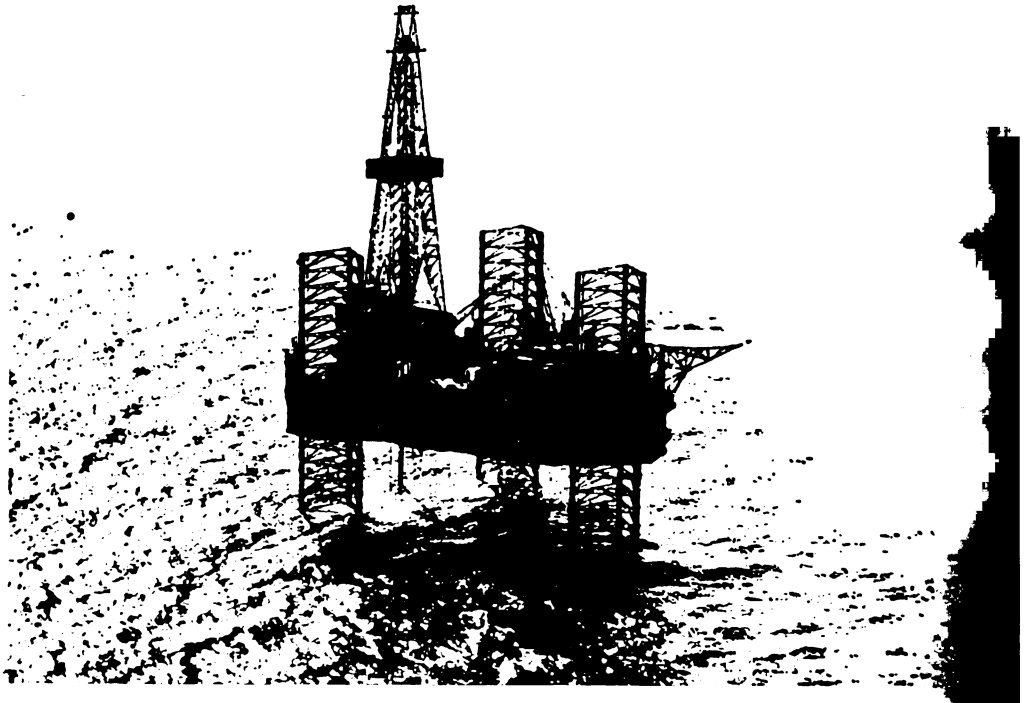

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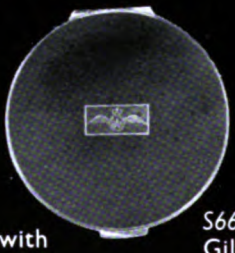

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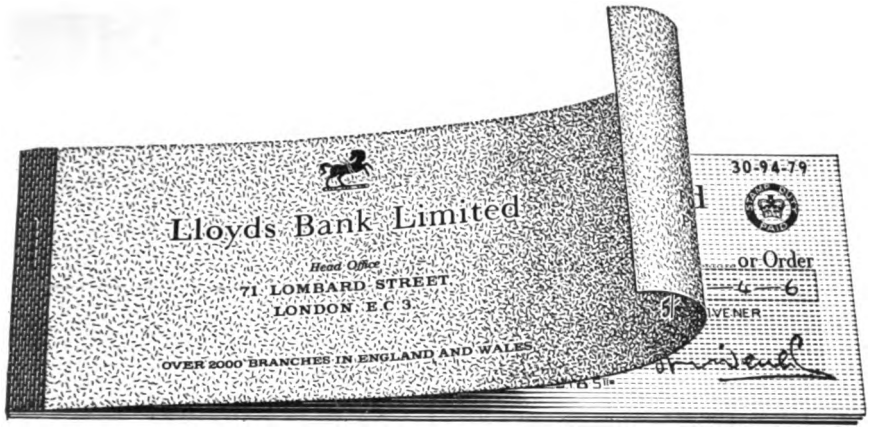

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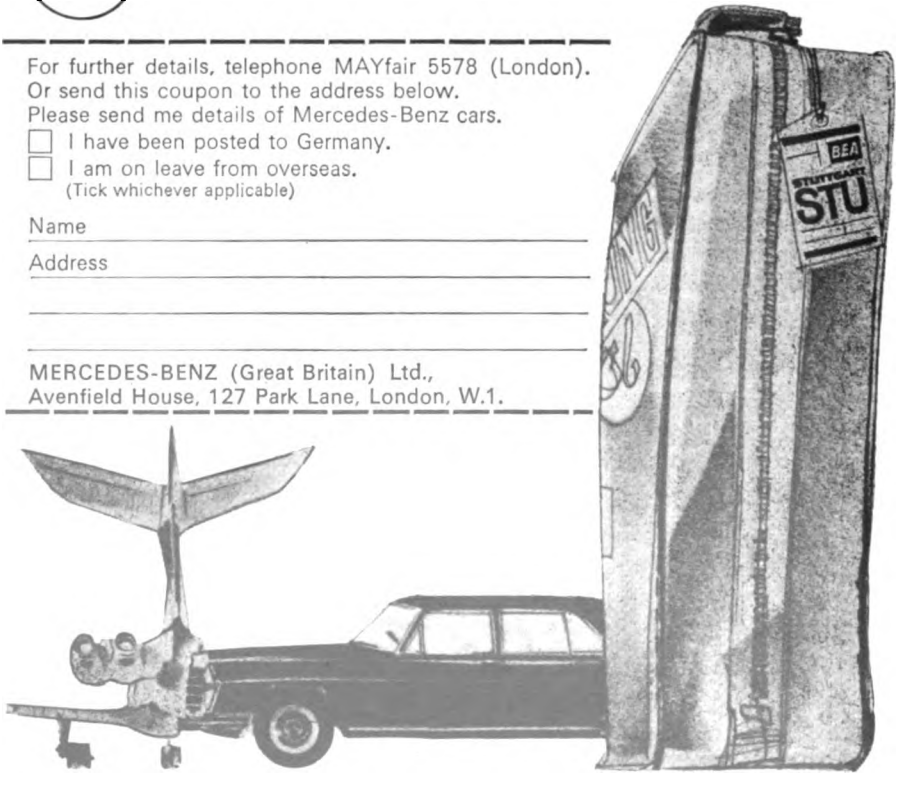

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"CANBERRA" AIRCRAFT IN ALERT HANGAR

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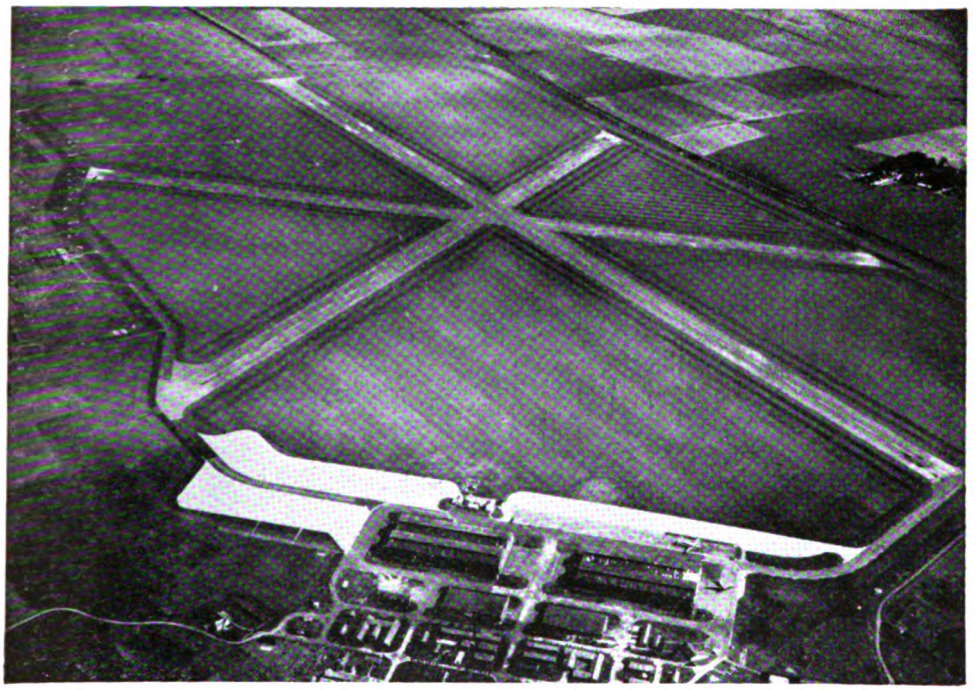

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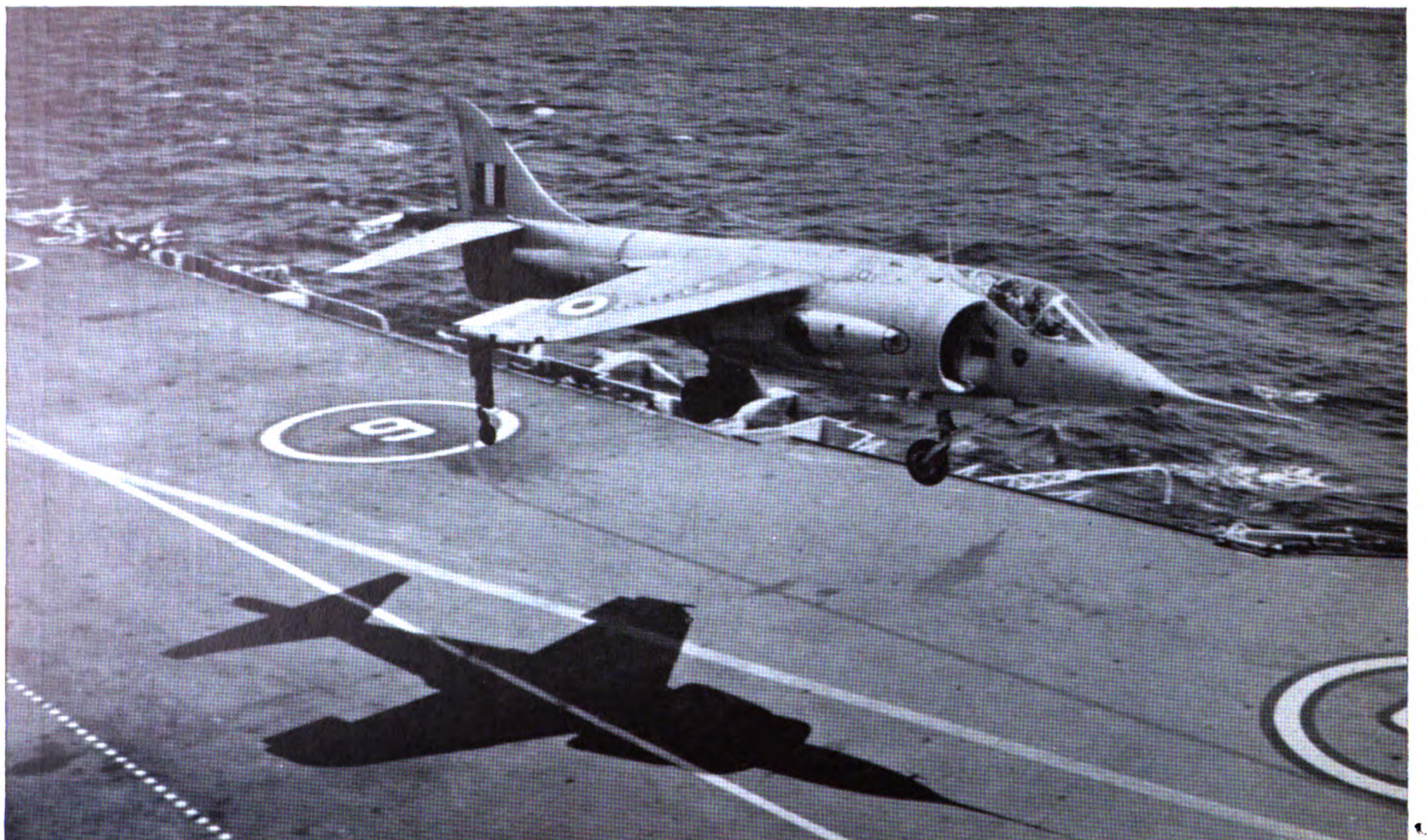

A Hawker Siddeley P.1127 piloted by Chief Test Pilot 'Bill' Bedford flew from its base at Dunsfold in Surrey to H.M.S. Bulwark operating in the English Channel on Saturday, 18th June.

The P.1127 arrived over the ship in a supersonic dive and after circling the ship decelerated to hovering flight and landed at zero forward speed on the flight deck.

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China & The World

By Dr. C. L. Wayper, M.A., Ph.D.

In accordance with the reflection of Oliver Wendell Holmes that investigation of the obvious is sometimes more profitable than research into the remote, this brief analysis of this vast subject seeks to establish the truth of the obvious but not always acknowledged propositions that while China pursues ideological objectives she gives to the concept of the national interest priority in her foreign policy and that this has not been such as to justify the view of her as a rogue elephant among the Powers, a country committed at whatever the cost, to the destruction of the existing order of things.

Both as nationalistic Chinese who ascribe many of their country's woes to the evils of imperialism and as communists who are determined to root out that capitalism of which they believe imperialism to be the inescapable consequence, China's leaders are dedicated to making the world anew in the image of their own ideology. As fanatical idealists they are too. Their declared aim, once also though apparently no longer the Russian, is " the creation of a new kind of human being." They believe that man was originally good and that as it is only his bad environment that has warped him, he can, by perfecting that environment, be restored to his original goodness. But the sins of the centuries will remain until the society of the centuries has been wholly remodelled; the perfection of his national but not of his international environment would leave him like the curate's egg—only partially good. Hence where the faith that will make all things new and all men good exists, they are bound to support it, " to lean to one side " as they did in their alliance with the U.S.S.R. Its struggles to establish itself they must look upon as ' holy ' and if they involve wars they must vow their support for such ' holy revolutionary wars.' Where revolutionary prospects are excellent, as Chou En-lai said they were in Africa, they must seek to make the most of them. Wherever error rears its ugly head, even if it should be in Moscow, they must denounce it for if the salt has lost its savour wherewith shall it be salted? They must cleave to the truth for this alone brought them victory in China and will bring them triumph in the world, teaching them how to " use the countryside to encircle and finally capture the cities." Their concern, then, with ideological objectives is self-evident.

Faith, however, is not in itself a blueprint for action and until its commands are interpreted can never become one. Moreover the interpretation of the faith which is essential if men are to know how best to act is itself dependent on the requirements of the countries in which the faithful have come to power, countries with which they come to be as identified as they are with their faith and which have long-established interests to be safeguarded. These even the most dedicated of

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revolutionaries cannot ignore for they will both wish to avoid the widespread and damaging opprobrium which would be their's if they did and to preserve as well as they can the power of what they will be bound to look upon as mankind's greatest hope, the spear-head of world revolution which if they are Russians they will believe they have forged in Russia and if Chinese they will be certain they have hammered out in China. Russian revolutionaries never wittingly neglected the interests of Russia but on the contrary found new ways of safeguarding them. The same is true of Chinese revolutionaries. The ideological ends they have pursued have always been in their eyes compatible with their interests. Was Mao wrong in believing that it was in China's interest to ally with the U.S.S.R. when it seems clear that there was greater hope in this way of securing China's northern territories and of tightening her grip on the old protective zone which covered the frontiers of the empire in Korea and in S.E. Asia than there would have been in association with the U.S. which could do little to help China in the north and which could only support her aspirations elsewhere at the expense both of her allies and of her own position in Japan? And is it not significant that China became convinced of the ideological impurity of the U.S.S.R. only when she found that the Soviet alliance could not be used to bring her Formosa? Where support of communists will secure her interests, as in strategically important lands like Korea and Vietnam, or where it will embarrass her enemies or help her to stake a claim on the future as in Africa, China has come to their aid, although only in the manner which her own interests dictate. Where however, ideological ends have not been compatible with the national interest China has not sought to pursue them. Burmese and Pakistani communists receive no Chinese help because China's national interest requires friendly, and not hostile governments in Burma and in Pakistan. We must, then, conclude that important as ideological objectives are to the Chinese it is not these but their idea of the national interest that determines their foreign policy.

But even if this is true politics are concerned with consequences and not with causes and what more, it might be asked, than what China has already said and done is needed to prove how utterly precarious peace will be when she comes to her full strength? We can hardly, however, regard her seizure of Tibet, which all except the unfortunate Tibetans agreed was part of China, as proof of her indulgence in international banditry. And we might suffer our indignation at her iniquitous encounter with international authority in Korea to abate a little when we recall that others besides the Chinese saw in that authority only an American alliance and when we ponder on those words written by a former American ambassador to the U.N, "Our associates at the U.N., as well as our opponents, should know that on issues which involve our own security, we Americans are capable of going our own way. This requires, of course, not only national power but also determination by our people to use it." We might regret China's behaviour on the Himalayas yet doubt if it impels the conclusion that she is bent upon wickedly aggressive courses and is the enemy of all stability and peace. When she claimed that the Ladakh road was in her own territory her case, however abruptly presented, was as good as the Indian which maintained that it was not and the military defeat that

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was inflicted on the Indians came only after they had declared that they would remove the Chinese by force and only after they had made obvious preparations to do so. And this situation, once having been created, itself explained the recent Chinese threat to India during the fighting over Kashmir. For China knew that if Pakistan had been overwhelmed, India could then have concentrated forces against her own and things being what they are it is more a proof of Chinese sagacity than of Chinese sin that they were ready to take timely action to prevent this. What State similarly placed could have been relied on to do otherwise? We may deplore China's announced intention of using force to acquire Formosa yet, remembering that all Chinese agree that Formosa is part of China, wonder if Americans and ourselves would not feel similarly inclined if they were deprived of Long Island and we of the Isle of Wight? We may, in any case, wonder how justified we are in deducing from what China says in certain circumstances what she would do in quite different conditions. The fact that she was prepared to advocate joint Chinese-Soviet action against Formosa in circumstances which seemed to justify the assumption that the main weight of American blows would fall not on herself but on the U.S.S.R. does not tell us what she is likely to do in conditions in which it is certain that they would not. We can learn nothing from her condemnation of Russian cowardice in withdrawing from Cuba as, unlike Lord Russell, she knew that it would make no difference whatever she said. She could afford to be irresponsible because she was not responsible and what people say when they are not responsible is a very unreliable guide to what they will do when they are.

If, however, we close our ears to what China says and open our eyes to what she does we must be more impressed with the caution that has attended her behaviour than with the immoderation that has characterised her language. Never since the Korean War has she allowed herself to be involved in war with a major Power. Will she forget that caution when she acquires full nuclear strength and with it the responsibility that goes with its possession, when she will be able to inflict intolerable damage but unable to avoid receiving it in turn? Will even her desire for Formosa lead her to forget it when, not being likely for many years after she attains nuclear strength to command that superior local power which enabled the U.S. in the Cuban crisis to avoid itself the choice between capitulation and the use of nuclear weapons and to force this choice upon the U.S.S.R., she would be unable to force that same choice upon the U.S. but would have to face the great and almost certainly insuperable difficulty of starting, for the sake of Formosa, a nuclear war in which she would be bound to lose far more than she would gain? If we think the answer is 'no' we will be suspicious of the view that China is bound in the years to come to take the place of Germany and of Japan as the prime cause of great international upheaval. We will be sure that it would be folly to expect outstanding virtue in her but will not be ready to believe that the absence of outstanding virtue is itself a proof of the presence of overwhelming vice. We will think it the height of stupidity not to keep our eye on her. But we will not look upon her as a rogue elephant among the Powers, ready in the madness of rage to bleed to death if only it can sink its tusks into its opponent and stamp him into oblivion.

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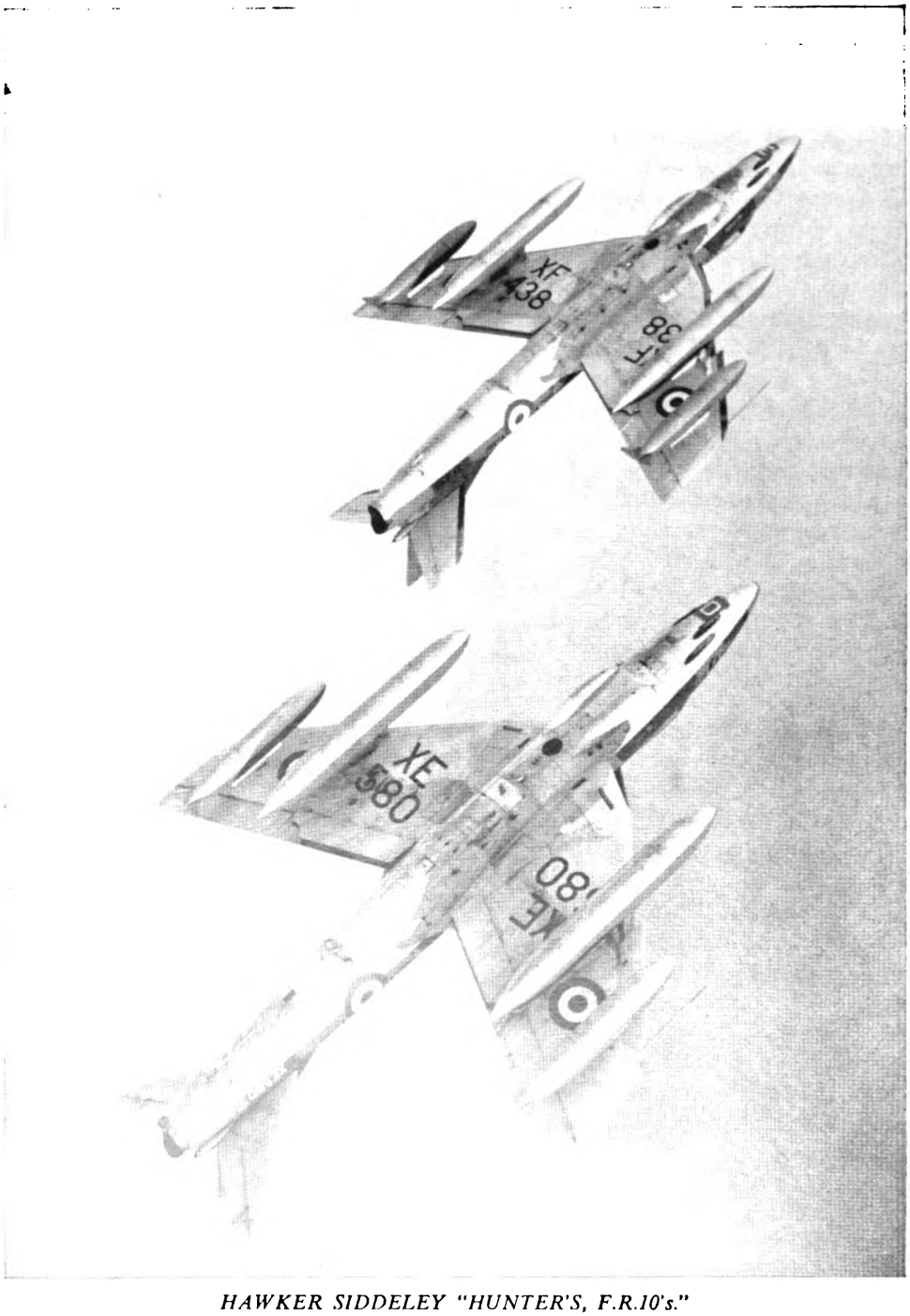

HAWKER SIDDELEY "HUNTER'S, F.R.10's."
In a reconnaissance role these aircraft of Nos. 2 and 4 Squadrons provide the information required by Army tactical commanders.
(*Ministry of Defence Photo*)

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Royal Air Force Germany

By

Air Marshal

Sir Denis Spotswood

K.C.B., C.B.E., D.S.O., D.F.C., R.A.F.

Commanding-in-Chief

1. RAF Germany now bears little resemblance to the Tactical Air Force of 1943 from which it developed. Then it was to be an element of the allied force for the invasion of the Continent; now it is part of a permanent British presence in Europe; and the role in 1944 of providing support to the Army in the field has been progressively replaced by a diversity of national and NATO commitments.

2. The first of these is a direct inheritance from the closing days of the Second World War. The Second Tactical Air Force was widely deployed in Western Europe when the war ended and it became part of the post-war Allied Forces of Occupation. It was given the responsibility, among other things, of policing the air space over the British Zone of Germany, and although the occupation status ended in 1954 the former occupying powers retained this responsibility. They have kept it ever since. RAF Germany therefore has the purely national, as opposed to NATO, task of preserving the integrity of the airspace in that part of Northern Germany which was formerly the British Zone. This is now referred to as the German portion of the 2nd Allied Tactical Air Force area.

3. An entirely new development in the Command came in 1958 when tactical strike aircraft were deployed into Germany to help counter the Russian preponderance of conventional forces, which the NATO nations could not match. This role has remained a key task for Royal Air Force Germany ever since.

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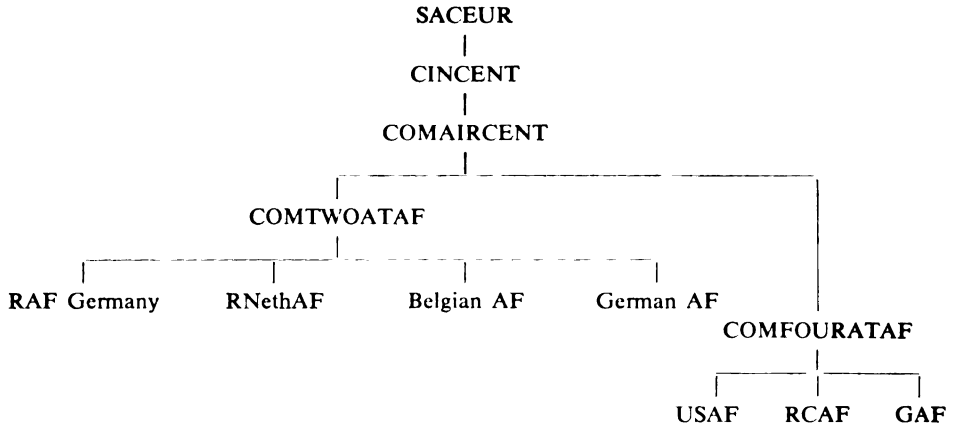
4. In Berlin the rights of the wartime allies have remained unchanged since 1945; the city remains under military government and the Western Powers still have the right of unrestricted access to the city including, of course, access by air. RAF Germany has the task of helping to preserve this access, a responsibility shared with the other two tripartite powers for West Berlin, the United States and France.

5. A more general role for the Command springs from our other national and international overseas commitments. In the original British agreement to station forces more or less permanently on the Continent, the possible need to withdraw them to meet serious overseas emergencies was forseen, and subject to SACEUR's agreement certain units in RAF Germany can be deployed outside Europe. This ability to reinforce other theatres was reaffirmed in the 1966 Defence White Paper and readiness to do it forms a part of RAF Germany's contingency preparations.

COMMAND

6. NATO's chain of air command in Central Europe will be clear from this diagram, which also shows where the assigned national elements fit into the two AIRCENT tactical air forces, which together provide the forces of that Command:



Operational command of all the Central Region air forces is exercised by COMAIRCENT, a post at present held by Air Chief Marshal Sir Edmund Hudleston. In peacetime the national elements assigned to NATO are held at various states of readiness laid down by SACEUR but they are not actually transferred to his operational control until there is an emergency. Control is, of course, transferred from time to time for exercises but operational command in peacetime is purely national, although certain NATO criteria have to be met. On the other hand, the national commanders retain responsibility for the administrative and logistic support of their forces in both peace and war.

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7. Until July this year the command of 2ATAF was held by Lieutenant General Burniaux, a Belgian officer; the post has now rotated to Britain and the appointment of C-in-C RAF Germany is now combined with that of COMTWOATAF. HQ RAF Germany is in the same large building as 2ATAF at Rheindahlen near Münchengladbach, and this has caused some confusion outside the NATO command about the posts of C-in-C RAF Germany and COMTWOATAF on previous occasions when they have been held by the same commander. The two staffs are, however, quite separate and RAF Germany is, for routine matters, directly under the operational and administrative control of MOD Air as are all overseas Commands. The difference is that, as the Commander-in-Chief wears an international as well as a national " hat," the day to day affairs of the Command are controlled by a Deputy Commander, an Air Vice-Marshal.

8. RAF Germany Headquarter's staff is a busy one. Apart from the normal channel of administration from MOD down to the stations, the Headquarters deals with the higher NATO formations, with the German Civil authorities on, for instance, the building of new married quarters, and with the British Embassy in Bonn for the many political problems of the zonal border and Berlin. The staff also work closely with the other tripartite powers on Berlin questions, with the German operations and air traffic services on airspace and overflying rights and finally, but by no means least in importance, with BAOR on matters of common interest between the two Commanders-in-Chief.

RECONNAISSANCE

9. Nuclear weapons have made possible a reduction in the number of strike aircraft needed to give required results; but there has been no such revolution in the essential role of reconnaissance. Commanders are still vitally concerned with what happens on the other side of the hill and a comparatively large air element of the overall force would be needed to give this information to the NATO commanders. Because in Europe it is necessary to guard against a conflict on any scale from a frontier incident to a full scale nuclear attack, reconnaissance is of paramount importance. It is the means by which commanders can estimate the scale of an attack and so decide on the proper response. In RAF Germany Canberra Photographic Reconnaissance Squadrons are equipped for day and night work and have been given the role of long range pre-strike and post-strike reconnaissance. Aircraft of these squadrons are held at a high state of readiness and when the situation calls for it their operational control can at a moment's notice be switched to SACEUR who then orders their missions from a central headquarters. Each Squadron is supported by a Mobile Field Photographic Unit made up of a convoy of photo-processing vehicles and caravans. The squadron aircraft can, of course, operate at high altitudes but the present tactical advantage which high looking radar gives to enemy defences means that most of their work is done at low levels. Intensive low flying practice in some parts of the AIRCENT area has led to political pressure for it to be done elsewhere, and these squadrons now make extensive use of the UK standard routes and areas as well as those on the Continent.

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10. Army tactical commanders are, if anything, even more demanding than SACEUR in the information they need about the battle zone. They must have details of enemy deployments as quickly as possible if they are to retain the initiative and draw the fangs from enemy attempts at surprise on the ground. This reconnaissance role is admirably filled by Nos. 2 and 4 Squadrons of Hunter FR 10s based at Gutersloh. From this airfield the two squadrons can make full productive use of their range and they work closely with NORTHAG ground forces deployed in the forward areas. The pilots on the Hunter FR squadrons are all at least second tourists. Many of them have done a tour on Ground Attack Hunters and are therefore already experienced in handling the aircraft confidently and skillfully at low level. They are able, after careful training, to operate their cameras accurately and at the same time to take in at a glance the details of their target so that they can also give a verbal report on the situation. To the commanders on the ground these speedy reports and the photographs are, of course, invaluable.

11. Exercise Royal Flush will already be well known to many readers. It is the annual contest between the air photographic reconnaissance elements of Nos. 2 and 4 Allied Tactical Air Forces, and RAF Germany has been represented each year since the first competition in 1956. Under the revised rules of 1964 the whole of the reconnaissance force, instead of merely representative teams, takes part in this competition for the Gruenther Trophy, named after the former Supreme Allied Commander Europe. The trophy is presented to the ATAF with the highest total number of points in the contest, and Second Allied Tactical Air Force has this year won the trophy for the third year running and for the seventh time overall. Nos. 4 and 80 Squadrons of RAF Germany did particularly well this year — No. 4 was judged the outstanding day reconnaissance squadron in Second Allied Tactical Air Force, and No. 80 the outstanding night reconnaissance squadron in the whole competition. The amount of effort which goes into training for Royal Flush is fully justified by the exceptional quality of the results which the squadrons produce. Rivalry is naturally fierce among the competitors and the basis of the contest, one ATAF against the other, is only one aspect of Royal Flush; intense but healthy rivalry also exists between the national elements taking part, and between the various reconnaissance squadrons.

STRIKE AND ATTACK

12. RAF Germany's most important weapon in SACEUR's armoury is at present wielded by Canberra all-weather strike squadrons based well back near the Dutch border on airfields which are linked, like the others, into the NATO communication system. A proportion of these aircraft is always held at immediate readiness and the rest are on a system of alert states to meet SACEUR's overall strike readiness plans. The Canberras can also, of course, quickly be converted to the conventional role if required. With conventional weapon fits they can operate as light bombers or as interdictor and ground attack aircraft using front guns.

13. These squadrons also compete for an international trophy. TWOATAF and FOURATAF take part in an annual competition which is designed to test the degree

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of training and the operational capability of the Central Region attack and strike squadrons. The main team prize, the Broadhurst Challenge Trophy, has been won by 4ATAF at each of the four meets so far held. This year the RAF Germany contribution to the 2ATAF team will be found by No. 3 Squadron, as the winners of the 1966 RAF Germany inter-Squadron Salmond Trophy for weapons proficiency. Four Canberras and six crews will take part with each crew completing eight sorties. Competition for the trophy is extremely keen and the final marks in all four meets have been very close; last year there was a margin of only 123 points in a maximum possible total of 4224.

AIR DEFENCE

LIGHTNINGS ON BATTLE FLIGHT DUTIES

(Ministry of Defence Photo)

14. Nos. 19 and 92 Squadrons, equipped with Lightnings and formerly based at Leconfield, have now taken over the duties of air defence within the Command from Nos. 5 and 11 Javelin Squadrons which were withdrawn. The British national responsibility calls for fighter aircraft to be at instant readiness, around the clock, to prevent intrusions and violations by any potential enemy. The Lightnings are scrambled to investigate and identify all unknown or unidentified aircraft tracks. The area of the mutual border with the Soviet occupied zone is, of course, particularly sensitive and an Air Defence Identification Zone, or ADIZ, 30 miles wide and immediately to the west of the border, has been set up from the Baltic to the Austro-German border. These Lightning Squadrons also form part of the British contribution to any tripartite operations to help preserve the right of access to Berlin. Special alert hangars and crew rooms have now been built near the runway so that the pilots can get airborne in the shortest possible time when an intrusion occurs, yet not be too uncomfortable during the long periods on standby. The ground

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environment of the air defence system is based on German Air Force radar stations manned by GAF personnel who in some cases have small units of RAF officers working with them. The Squadrons, and the air defence personnel, are assigned to SACEUR for NATO duties, and in the event of a NATO alert they would come under his command through COMTWOATAF alongside the air forces of Holland, Belguim and West Germany in the 2ATAF area.

HELICOPTER SUPPORT

WESSEX MK II OPERATING IN THE FIELD
(Ministry of Defence Photo)

15. No. 18 Wessex Helicopter Squadron works very closely with BAOR; its role in peace is to train with the Army, and in war to operate tactically with them in the field. This squadron, and the Helicopter Control Squadron (its Forward Air Transport Operations Centre) are both highly mobile and help to give units of BAOR a degree of tactical flexibility which only air power can provide. Like the other units of RAF Germany the helicopters are held at readiness and the squadron can deploy quickly into the field as a self contained unit. The squadron is highly professional and has quickly accumulated a great deal of experience in the field since it moved out from the UK.

BERLIN AND EAST GERMANY

16. Each of the three air corridors to Berlin is available to the tripartite governing powers of West Berlin. Civil flights go down the corridors to Tempelhof, the inter-

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national airport, but British trooping flights and flights by the RAF Germany Communications Squadron use Gatow, the RFA airfield which played a very important part in the Berlin airlift 18 years ago. Today, Gatow is fully equipped and prepared for all emergencies. The Command Communications Squadron operates, apart from its many other duties in Germany, a scheduled service to Berlin and provides the essential link between Gatow and the airfields to the West.

17. The Russians withdrew some years ago from the Allied Kommandantura for the Government of Berlin, but the Berlin Air Safety Centre remains, and here the four powers have direct daily contact with each other. In this building the controllers from each of the four nations work together to coordinate flying activity in the Berlin Air Traffic Zone and in the three corridors linking Berlin with the West.

18. RAF Germany has one other direct contact with the Russians. A group captain and a small staff, with interpreters, clerks and drivers, serve on the British Military Mission to the Group of Soviet Forces in Germany. They spend much of their time touring in East Germany, as do their opposite numbers on the Soviet Mission in West Germany. The mission members see a good deal of the Russian military mission to the British Forces both socially and professionally and the contact is found to be a useful channel of communication. For example, when the Commanders-in-Chief from West or East visit each other, as they have done each year recently, the missions get together to arrange the details of the programme.

VISITS AND OVERSEAS FLIGHTS

19. Canberra aircraft from Germany make frequent training flights to Cyprus, North Africa, Malta and AFME. In recent years they have also made flights to the Far East and especially to Malaya. In this way the crews are practised in rapid redeployment to other theatres, accustomed to operate in varied climates and given weapons training on overseas firing and bombing ranges. The Hunter squadrons are also given overseas flights, mainly to North Africa and Cyprus, where again invaluable weapons training is done particularly at the ranges in the North African desert. Other deployment exercises are carried out to Norway as part of the NATO reinforcement plans for that area. Very valuable exchanges are also made between squadrons within NATO in which detachments from the squadrons in RAF Germany operate with their counterparts in the air forces of Belgium, Denmark, France, Holland, Italy and Norway. Return visits from these air forces are a normal feature in the Command's activities. These exchanges offer useful opportunities to learn from each other and naturally they are greatly prized by the crews lucky enough to take part. The social side of these exchanges is no less enjoyable and just as useful in bringing the various nationalities closer together. Language is no real barrier in these circumstances; French and English are both used as the formal tongues, but English is the common language in the squadrons. Finally, a detachment of three helicopters from No. 18 Squadron is held in Cyprus as part of the UN peace-keeping force.

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TRAINING

20. Because of its many roles the Command plans for a variety of possible contingencies; it must be flexible and ready at short notice to react to any of them. The calendar of exercises in RAF Germany is therefore a full one. The Command takes a full part in the NATO alert exercises, in the international events and in the purely national exercises involving BAOR or our forces in the UK. All these training activities, which are played as realistically as possible, help to keep the Command up to date on techniques and fully ready to do its job. Reaction to practice alerts and other exercises is always immediate and it is very encouraging to watch the Command flex its muscles on these occasions.

21. A very accurate measure of the efficiency of NATO units is given by international Tactical Evaluation teams whose practice it is to arrive unannounced at operational airfields, deploy observers at all key points, and then simulate an alert. The training value of these Tacevals is first class; there is great enthusiasm between squadrons, stations and nationalities for high Taceval scores and the results which the units of RAF Germany produce on these exercises are very good indeed.

WELFARE

22. In almost all branches of the Services the proportion of married to unmarried men has greatly increased in recent years, and in British Forces Germany the position has now been reached where there are more British wives and children than there are Servicemen. Not surprisingly an enormous administrative effort goes into the housing, schooling and general welfare of RAF Germany and its dependants. There is still a housing shortage, but the situation is improving considerably after enormous efforts by the staff and the stations concerned. The number of applicants for married quarters goes up almost as fast as the quarters can be provided; but the figures of quarters available expressed as a percentage of those qualified to occupy them are at least encouraging. The percentage was 67 in 1960, 73 in 1963 and this year the figure is 75. Next year will show another improvement and it is hoped that the percentage will reach 80.

23. One innovation that has been used to help overcome the shortage of quarters is the multiple hiring scheme. No treasury funds were available to build more quarters on RAF stations because of the danger of further drains on sterling; but it was agreed that loans could be made to German development firms to build, near stations, blocks of flats which the Service would hire at contract rates. Many of these blocks are now finished. They are re-rented by the Service and occupied by families as normal married accommodation. This scheme has been successful in housing many more people than would otherwise have been possible.

24. The main welfare problem of overseas service in many parts of the world — that of isolation in totally alien surroundings — is, in general, not found in Germany. Leave facilities are excellent, the local populations are friendly and the fact that flights to the United Kingdom by civil airlines at reduced fares take only an hour or two makes most of the Servicemen and their families feel very close to home.

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Germany is almost ideal in having most of the attractions of overseas service and very few of the drawbacks. Cars and petrol are not too expensive and the autobahns bring Continental holiday areas within reach of most Servicemen and their families during a tour in the Command.

THE FUTURE

25. The recent Defence Review makes it clear that the ground forces in Germany are to remain at about their present strength, but that their conventional air support will be increased. This will be done at the cost of some reduction in the number of nuclear strike aircraft based in Germany and it is clear that RAF Germany will, in the next few years, undergo another transformation to keep it abreast of developments. The Command's contribution to our global strategy will not, however, be changed because it is fundamental to our defence policy. The deployment of British military forces outside Europe has always been dependent on the security of the home base. It was traditionally a security which rested on sea power and on preserving a balance in Europe itself. The situation has radically changed in two ways; firstly the balance has now been replaced by a world balance, and secondly the defences of the home base no longer lie in the Channel but half way across the Continent.

26. British forces seem committed to this position in Europe for many years, and although changes in NATO strategy may cause adjustments and technical developments may bring shifts of emphasis, air power will continue to be a vital element in the pattern of this defence. By providing an important contribution to deterrence and defence in NATO RAF Germany is helping to secure the home base. Only this security allows the UK the freedom of action to deploy forces overseas to undertake its other world-wide commitments.

THE NATIONAL WAR COLLEGE, U.S.A.

Since the issue of our new edition, requests have been received from U.S.A. to republish four articles from *The Royal Air Forces Quarterly* for required reading by students of their National War College.

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Just some of the 1,200 guests dining in the Great Room at Grosvenor House during the course of the Anglo-American Air Forces Friendship Ball.

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R.A.F. AND U.S.A.F. UNITE IN GREAT 'FRIENDSHIP BALL'

By A. F. Tinsley

THROUGH war and peace a high regard, one for the other, and a close friendship and co-operation have long existed between the Royal Air Force and the United States Air Force. And it was with the desire tangibly and publicly to illustrate this happy state of affairs that last year the U.S.A.F. Association (London Chapter) approached the Royal Air Forces Association with the suggestion that jointly they should promote some Anglo-American function in London at which members of the two Services, their wives and friends, and others who, though not members, were closely associated with the two Air Forces, might gather.

Just what form the function should take would be a matter for discussion, but that 1966, the year of the 21st anniversary of Victory in Europe, to which the two Air Forces had contributed so much, was the ideal year in which to hold such a function, seemed to go without saying. Whatever was decided upon, there should be, it was suggested, no question of trying to make any profit, but should a profit result the money should be equally shared by the R.A.F.A. and the U.S.A.F. (London Chapter) welfare organisations.

To the R.A.F.A. the idea seemed excellent; well worth taking a chance on. To be sure, it would be a gamble, but the R.A.F. and U.S.A.F. had gambled for far greater stakes together in war, and turned up trumps, so why should not a joint peacetime social " Operation " be successful?

The R.A.F.A. joined wholeheartedly in the scheme. A committee was formed of R.A.F.A., U.S.A.F.A., R.A.F. and U.S.A.F. representatives, and after careful discussion it was decided to hold an " Anglo-American Air Forces Friendship Ball " at Grosvenor House, Park Lane, on May 7 — the 21st anniversary of V-E Day. As they embarked upon the months of planning and hard work to come, the committee had no idea that the venture was to be the tremendous success that it turned out to be. A price of three guineas ($9) a ticket was agreed upon — reasonable indeed for what was ultimately provided — bright eye-catching posters in red, white and blue, and bearing the R.A.F. Ensign and the United States Flag were produced and distributed. An evening of dining, dancing, cabaret and other attractions was arranged. Early in 1966 a trickle of applications for tickets began. Soon it changed to a flood.

A long and impressive list of Patrons was got together, at the head of it the Queen and President Lyndon Johnson, Marshal of the Royal Air Force H.R.H. the Duke of Edinburgh, Air Chief Commandant H.R.H. the Duchess of Gloucester, Air Marshal H.R.H. Prince Bernhard of the Netherlands, the United States Ambassador

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to the Court of St. James, and General Dwight D. Eisenhower, Supreme Commander Allied Expeditionary Force on D-Day. Other Patrons included 17 U.S.A.F. Generals, 22 R.A.F. Air Marshals headed by Marshal of the R.A.F. The Lord Tedder, President of the R.A.F.A., and Air Chief Marshal Sir Charles Elworthy, Chief of the Air Staff, Lord Shackleton, Minister of Defence for the R.A.F., and many, many other people from both sides of the Atlantic prominent in the Services, industry, commerce, the professions and the entertainment world.

On the beautiful spring evening of May 7 the stage was set in Grosvenor House. The dance bands of the Central Band of the R.A.F. and of the 3rd U.S.A.F. at Ruislip, and the Salon Orchestra of the Central Band were in their places. The great ballroom was a dazzling scene of beautifully decorated and beflagged tables. Into the Grosvenor House lobby poured twelve-hundred men and women, a brilliant sight in their evening gowns and, in the case of most of the men, Naval, Army and Air Forces mess kits. The venture was a sell out. Nearly 600 applicants had been unable to obtain tickets. " Operation R.A.F.A. - U.S.A.F.A." was a success; bang on target. Before the evening was half over Grosvenor House had been booked for the second annual " Friendship Ball " on May 6, 1967.

During the six hours of festivities, so much happened that it was almost impossible to take it all in. At 8 o'clock the great gathering sat down to dine at more than 100 tables set around the dance floor — tables filled with happy people of American, British and other nationalities all mixed up together. Old friends met again; new friends were quickly made. The accents one heard stretched across the U.S.A. from Maine to Florida, from New York to California, and across Britain from John o' Groats to Land's End. Enjoying himself hugely, and obviously happy to be among so many of the R.A.F., in which in 1944 he was trained and gained his pilot wings, was King Peter of Yugoslavia. The dinner was outstanding and the dance music first class. Soon the floor was a mass of tightly-packed dancing couples, able to do little more than shuffle round, but that did not matter. Fun and friendship was the thing, and fun and friendship they found in lavish proportions.

A burst of applause greeted an announcement that a second Ball was to be held in 1967; and a cheer went up when Air Chief Marshal Elworthy was named winner of the second prize in the lucky number contest — a magnificent wrist-watch, which he generously handed back to the Committee to be used as a prize at the R.A.F.A. Ball at the Dorchester in September. First prize went to a retired R.A.F. squadron leader and his wife. It was two return tickets by air to the U.S.A., where a round of entertainment was arranged for the lucky couple by the Americans. The sale of Tombola tickets for scores of prizes brought in over £500.

The cabaret provided a welcome respite for the tired dancers. A fine, fast-moving show, its highlight was a West Indian steel band and limbo team, complete with voluptuous lady dancer, and a seemingly filleted male limbo expert, who made wriggling under a flaming cross-bar look easy, which it wasn't, as several young revellers discovered when, shedding jackets and shoes, they added to the fun of the show by trying, unsuccessfully, to beat the limbo experts at their own game.

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One very happy aspect of the evening was the mingling of the heroes of World War Two, the V.C. holders of the R.A.F. and parties of former U.S.A.F. members who had flown over from New York and Washington specially to attend the Ball. Among the high-ranking American officers was General Lawrence Kuter, who brought with him a framed scroll of tribute to the R.A.F.A. from the U.S.A.F.A., which he presented to Air Marshal Sir Harold Lydford, Chairman of the R.A.F.A. Council. In their meeting, two old friends of the war days who had served together were united again for the first time in 20 years.

Immensely impressive was the solemn, proud ceremonial entry following a fanfare by trumpeters of the R.A.F. Central Band of the Flags of Britain and America, respectively borne and escorted by N.C.O.'s of the Queen's Colour Squadron, R.A.F., and by an N.C.O. and airman of the 3rd U.S.A.F. As the two National Anthems were played, 1,200 people from two Continents stood in silent homage. The Ball Committee invited the flag escort parties to remain after the ceremony as guests, and together with their wives the British and American airmen stayed to enjoy the rest of the evening. Said one R.A.F. Regiment sergeant, "We never expected this to happen, and we certainly do appreciate the Committee's kind gesture."

Putting the seal upon the evening were three messages received by the Committee — one from the Queen, in which Her Majesty expressed her pleasure " that the firm friendship between the Air Forces of the United States and Great Britain should be symbolised in such an enjoyable way," one from President Johnson which referred to " this well-deserved tribute to the partnership of our great Air Forces and to the close bonds which exist between our two nations," and one, dated " Gettysburg " and signed " Ike " from General Eisenhower. In this the D-Day " Supremo " said he wished " to pay my respect and present my affectionate greetings to old comrades-in-arms and give public evidence again of my devotion to the basic cause involved, namely that of British-American solidarity in the defence of freedom." " Ike " would have attended the Ball had not his doctors advised him against making long and tiring journeys.

The evening's most poignant moment came at 12.16 a.m. when, at the precise time of Victory in Europe in 1945, Anne Shelton took the floor to sing a series of beloved old wartime songs. Soon everyone was singing with her. The minds of many present were transported back 21 years to what had been one of the great moments in world history. Amid the nostalgia, something of the excitement of May 7, 1945 was reborn at Grosvenor House. The sight of the great assemblage, hands linked in friendship and singing " Auld Lang Syne " and the British and American National Anthems was as moving as it was unforgettable.

And so, at last, the great occasion drew to its close. The captains and the kings departed, and the first Anglo-American Air Forces Friendship Ball was over. It had been successful beyond the wildest dreams of its army of British and American organisers. Perhaps it had been the first of many such balls to come. If the response on May 7 was any criterion, it must have been. The welfare organisations of the R.A.F.A. and U.S.A.F.A. were enriched by some £200 each — the profit from a venture which had paid off and done what it was intended to do; cement even more firmly Anglo-American Air Forces friendship and understanding.

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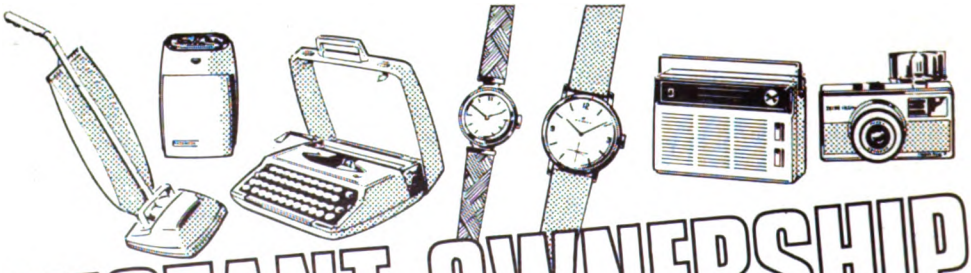

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THE SOVIETS IN WORLD AFFAIRS

By Wing Commander J. F. L. Long, M.A., R.A.F. (Retd.)

BEFORE the great gathering of the Soviet communist clans took place in Moscow at the end of last March, with delegates from nearly all the Communist parties of the world in attendance, many expert observers in the West were hopeful that much that we did not know about the aims of the men who took over from Khrushchev in October, 1964, would be revealed and that exciting developments would be announced. In the upshot, the experts must have been disappointed. Not only was the Congress of the Soviet Communist Party about the dullest on record, but practically nothing was added to the sum of what we knew already about the Soviet party and its aims and intentions. The only exception, possibly, was the speech of Marshal Malinovsky, the USSR's Minister of Defence, who did at least brighten up the proceedings with some rude remarks about the West and some others about the continuing need for a Soviet strategic air force (the Americans and ourselves seem to be moving in the opposite direction!), about the setting up of an anti-missile missile system in the USSR and about the completion of a round-the-world underwater cruise by a group of Soviet nuclear submarines. By comparison the Soviet foreign minister's contribution was predictable.

A cynical observer might have concluded that the new leaders really look a very dull lot by the side of the rumbustious, energetic, vulgar, engagingly direct and extrovert showman Nikita Khrushchev, but this would be a very superficial judgement indeed. The new leaders are as well aware as Khrushchev was that they have to adjust to changes in many spheres. They have chosen to concentrate mainly on changes inside the Soviet Union; and some of these, potentially, are of far-reaching significance if they ever get off the ground. But when it comes to trying to decide how far these changes are likely to affect the conduct of the Soviet Union in the world arena, that is *how* its external policy may change, we find the answer rather difficult to give. There have been signs of change, but not, so far, any revolutionary shifts. And we may well wonder why.

There are two main reasons for this state of affairs. One has to do with the nature of sovereign nation states and the way sovereign nation states behave in the world at large. The other has to do with the quandary that all revolutionary-minded states (like the USSR, the UAR or Indonesia) find themselves in when they have to adjust to living in the world together with other sovereign states. In a nutshell, the new leaders in the Soviet Union are trying to make up their minds, as each successive new administration in the USSR has had to, how far a conventional foreign policy can support the revolutionary aims of a Communist state — in this case, the most powerful state in the world next to the USA. And to understand their problem better—and, perhaps, ours—it is necessary to digress for a moment and ask ourselves

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what foreign policy is about and what role the Communist states see it as theirs to play in the world at large.(1)

The End of Foreign Policy

The question of what foreign policy is about may be dealt with first. It can be summed up quite simply. There is no mystery. The foremost aim of a sovereign state's foreign policy is the preservation of that state's security. The success or failure of a foreign policy must be judged solely by this rather practical touchstone. Foreign policy, despite all the talk of the politicians, is not *primarily* about things like "peace," "upholding the United Nations," or even "putting an end to the savage practice of female circumcision in the Sudan." When sovereign states claim, as they are very fond of doing, that their foreign policy is primarily directed to these ends, it is not that they are telling lies or trying to deceive — well, not generally — all they are doing is to go through certain symbolic or ritual motions we all understand by instinct, even though we cannot always find the right words to describe what is really meant by the motions we observe. What a sovereign state really means when it says that its chief aim is peace -- to take only one example from our list — is that it expects the behaviour of other sovereign states to be such that its own security is in no way threatened.

Generally, all sovereign states profess "peace" as a chief aim of their foreign policy, but we notice that all the experienced ones add sets of conditions that will have to be observed if "peace," in their sense, is to continue. We have only to think for a moment of the way in which the introduction of Soviet missiles into "sovereign" Cuba suddenly created a "threat of peace" to realize the truth of this — in this case the USA bluntly and correctly laid down the conditions.

Foreign policy, then, is not first and foremost, a moral matter, or a philanthropic matter, or a matter of justice — these things in the harsh world of foreign affairs, though unimportant, take second place to national security. Foreign policy has to do with national action in the world arena, and the limits of national action are set, not primarily by the inclinations of individual politicians, or by the demands of interested groups within a community — though these things may influence affairs over a period of time — but, fundamentally, by lines of force prevailing in the world at large. This means that the Soviet leaders, like the leaders of any other sovereign state, are not free agents in the conduct of their foreign policy, as many people think, but are most of the time severely limited in the action they would like to take at any given moment.

Communist Revolutionary Aims

The second point that we must be clear about — and this may at first sight seem to contradict what has just been said — relates to the role which Communist states see as theirs to play in the world at large, in particular, the role which the Soviet Union, as the senior and most powerful of the Communist powers, sees as its to play.

(1) It is not part of the purpose of this article to argue the merits of the scientistic approach to international affairs so much in vogue in the USA today against the merits of the classical approach, which the present writer without apology adopts. For an excellent discussion of the weaknesses of the scientistic approach, see "International Theory: The Case for a Classical Approach," by Hedley Bull, *World Politics* (Princeton University Press), April, 1966, pp. 361-377.

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To put it briefly, the Soviet Union claims that it is dedicated through its policies — not least its foreign policy — to bring about by degrees the destruction of the capitalist world — that is the world we live in — and with it, the destruction of the whole system of sovereign nation states which, it claims, grew up out of capitalism. We may firmly believe that the theories of Karl Marx — from which this objective stems — are all nonsense, but the fact remains that successive Soviet leaderships have dedicated themselves to the same end. They see nation states merging by degrees into a world-wide economic partnership, operating according to Communist principles of planning and production. All Communists, not only the Soviet ones, are convinced, just as strongly as was mediaeval man of a Last Judgement, that the capitalist system must die and that victory in the end must be theirs, something that is inevitable, foreordained. You can't stop the march of history, they say.(2)

For a very short period in its existence — just after the Revolution in 1917 — the Soviet Union indeed acted as though the distant objective — the destruction of the capitalist system — was an immediate and pressing aim, something which the workers of the world, by casting off their capitalist chains and uniting, could achieve at a sweep. But, as even Lenin had learnt before he died in 1924, world revolution was not to be achieved in this way. One by one he had seen the possibilities of revolution in countries like Germany and Hungary peter out. It was left to Stalin in one of his more imaginative moments — he did have some, whatever Khrushchev said to the contrary — to balance the distant revolutionary aim and the immediate one of finding a way for the USSR to live in what was regarded as a hostile environment of capitalist states. He evolved the novel notion of "Socialism in One Country" — by which he meant that, in modern conditions, revolution had to be achieved in distinct, self-contained phases. Revolution *happened* to have occurred first in the USSR. Because of this, the USSR automatically became the bulwark of socialism and revolution, and it became the duty of all foreign Communists to support the Soviet Union's policies, if necessary, against their own national interests. Equally, in Stalin's time, it became the duty of foreign Communists to sacrifice themselves, if need be, to the over-riding need to preserve the revolution in Russia intact. The conflict became at once apparent between long-distance revolutionary aims and shorter-term considerations of defending the security of the Soviet state. Thus, when he had to, in the early 1930s, Stalin sacrificed the German Communist party to appease Hitler, and, in 1939, shook the world by concluding the notorious pact with Nazi Germany simply in order to ward off war a little longer, or, as Stalin would have said, he signed it in the national interest, as he conceived it.

Khrushchev's Foreign Policy Failures

We are now in a position to appreciate what sort of arguments Khrushchev's colleagues were having among themselves about foreign policy when they decided to sack their chief in October, 1964. Actually, it is not likely that questions of foreign

(2) For a more detailed description of this view, see "Aspects of the Communist Challenge, I and II," *Quarterly*, Spring and Summer, 1964.

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policy, China apart, figured prominently among the causes that led to the sacking, but there can be little doubt that very serious misgivings had been raised in the minds of Khrushchev's colleagues about the results of his foreign policy.(3) If the revolutionary aim was supposed to be uppermost in Soviet calculations, then how could Khrushchev explain the loss of China's friendship and the devastating split in the world Communist movement? If this was one of the by-products of his famous de-Stalinization act of a decade ago, was de-Stalinization really worth the candle? What was the use of trying to purge the Communist movement of the Chinese and their supporters if, in the process, the movement fell into pieces or was desperately weakened? Or on the other hand if considerations of foreign policy pure and simple weighed most, why had he turned China — with whom the USSR shares an immense common boundary — into a hostile country and one armed with the "bomb," and at the same time allowed a situation to develop in Europe which, from the Soviet Union's point of view, far from lessening tensions, had increased them in the shape of a revived military power in West Germany, which in October, 1964, seemed to be about to become a major partner in the multilateral nuclear force? (True, looking at the situation now, we may feel that Soviet fears about the prospects of this force coming to anything were probably grossly exaggerated, but at the time, it certainly looked as though this force, or something like it, had almost reached the operational stage.) What sort of foreign policy is this, Khrushchev's critics must have been saying, that exposes the Soviet Union on two fronts, in the East and the West, at one and the same time?

The New Leaders Change Gear

There were, of course, other grounds for feeling dissatisfied with Khrushchev which cannot be gone into here, and by October, 1964, the doubts about Khrushchev's policies were so widespread inside the highest councils of the party and the government that they crystallized suddenly into an underhand (but not untypical) action to get rid of him. Once Khrushchev had been got rid of, the new leaders made some gestures of friendship towards the Chinese, indicating that they did not intend, if they could, to split the Communist movement, let Khrushchev's planned trip to Western Germany drop by the wayside; and then they began to mark time until they could find their bearings.

The end of this stage came in February a year ago when the new leaders suddenly had to make up their minds whether they were going to send military aid to North Vietnam or not, and if they were, what sort of military aid it was to be. This was not an easy decision for the new leaders to take because whatever they did would affect their relations with two very important countries — China and the USA. Anyhow, the need to take some sort of a decision forced the new leaders to start looking outwards at the whole international scene in an effort to find routes by which to escape from the limitations of Khrushchev's policies. They had to find manoeuvring room, lots of it, and quick.

(3) See "Nikita Khrushchev — Unperson," *Quarterly*, Spring 1965

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A sign that this search for manoeuvring room was on in earnest could be seen in the very great increase that occurred shortly afterwards in the number of high-level foreign delegations visiting the USSR and of visits by Soviet delegations to foreign parts. Brezhnev had something to say about this at a top level meeting in Moscow at the end of September, 1965. He was probably telling no more than the truth. He said that these visits offered the Soviet leaders an opportunity to familiarize themselves with the policies of other states and to explain "more substantially" their own views and policies. In all this one sees the Soviet leaders as being desperately anxious to dampen down what they feel is an overheated international atmosphere by talking. The old maxim that "Jaw, jaw is better than war, war" applies exactly to what they are doing.

At the same time, they are making sure that the right men are in the right embassy posts abroad. Luckily for them, there had been relatively few changes towards the end of Khrushchev's reign, so after a long lull — six months in fact — during which the new leaders left everything as it was, suddenly a big general post started in which, in a matter of only eight months, a quarter of all Soviet ambassadors and officials of similar status were changed. These included the senior Soviet representative in the United Nations' Secretariat and the Soviet ambassadors to France and China — both very important posts. The rate of turnover, incidentally, was about twice the average rate and looked very much like a deliberate attempt to root out the tired old men and replace them by others more attuned to the new leaders' ideas.

Defeats and Successes

But in the field of diplomacy itself the new leaders have obviously had to admit some temporary — even permanent — defeats. They have accepted that the normalization of relations with China and the re-establishment of unity between the two fraternal Communist parties is absolutely out of the question for some time. They have faced the fact, too, but with much greater reluctance, that relations with the USA (about which they were quite hopeful when they took over) have become "considerably complicated" and are on the point of freezing. The price of an understanding with the USA, they realize, is beyond reach at the moment and must remain so while the Soviet Union backs, or appears to back, the conditions laid down by the North Vietnamese for bringing the war in Vietnam to an end. On the question of a German settlement (i.e., a peace treaty) and the wider question of an arrangement on European security, the position of the new leaders appears even more rigid than Khrushchev's and, in the short run, it is difficult to see that they are likely to come up with any radically new proposals. Certainly they seem to hope that their quiet flirtation with France will oblige the Americans and ourselves to accept talks on the basis of what the Russians call "the new situation in Europe" (i.e., they want all interested *European* powers to sit down and hammer out an arrangement over Germany, and not simply the victors in the last war). But apart from this, the new leaders have made no significant attempt to disturb the delicate equilibrium in Europe. No new ground has been broken at the disarmament talks in Geneva. No

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further cuts in the Soviet Union's military budget — to match those of December, 1964 — have been made. Rather the reverse. To judge from their public utterances and by some of their actions, the new leaders may be seriously toying with the idea of spending more money on armaments and the armed forces.

This, we notice, is by no means a completely negative stance, as some experts argue. It is more than anything else an attempt to feel out the positions of the "enemy" in all those areas abondoned by Khrushchev. But in some directions Soviet diplomacy is showing very definite signs of pressing forward. In Eastern Europe, for instance, where the Soviet Union has failed conspicuously to discover a recipe for dealing effectively with the unmistakable manifestations of economic nationalism that have followed so closely in the wake of a revived political nationalism, the new leaders have been at considerable pains to stress the growing importance of the Warsaw Pact organization and particularly the need for creating within its framework what has been pointedly called "a permanent and prompt mechanism for considering pressing problems." Their intentions are ambiguous, it is true, but they do seem to indicate an interest in fashioning a new political relationship between the USSR and the states of Eastern Europe based on the Warsaw Pact on the one hand, and on direct links, on the other, between each of the East European states and the USSR. This is a very interesting development indeed and seems to be coupled with the attempt to counter the threat which the growing military strength of Western Germany is supposed to present to the Soviet Union. It is certainly linked with the decision taken early last year to use France as a battering ram to open up the cracks in Nato — with rather spectacular results!

Further south, where Europe meets the Near East and at the point where the Nato and Cento flanks coincide, Soviet diplomacy is energetically at work pursuing a course set in Khrushchev's time to lever Turkey out of both military alliances. The bait to Turkey — refusal on the part of the USSR to countenance the union of Cyprus with Greece as a solution to the Cyprus problem and a promise of substantial economic aid in coming years — has been laid very shrewdly indeed at a moment when the political tide in Turkey is seen by some to be running strongly in the direction of neutralism. Further east links (which again were beginning to be forged under Khrushchev) with Iran, Afghanistan, Pakistan and India are being strengthened with the openly admitted object of creating for the first time a line of friendly states along the USSR's southern frontier between the Bosporus and the Himalayas. As the Soviet efforts at the Tashkent talks between India and Pakistan showed, the USSR is keenly interested in everything that goes on in this part of the world.

In the Far East the possibilities of economic co-operation between the USSR and Japan are being explored carefully at the moment. Should a long-term arrangement result in this part of the world, it could have a special significance in two ways: first, in hastening the development of Eastern Siberia and, second in bringing about an improvement in the whole Soviet strategic position in relation to China and the USA by the penetration of the screen between the USSR and the Pacific Ocean formed by the Japanese islands and the pushing back of US military power. Elsewhere, in Latin America, we notice that organizational activity among left-wing groups appears

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to be definitely on the increase while, in the Afro-Asian world, a much more vigorous line has been taken to defend the Soviet Union's claim to being an Asian state against Chinese assertions that it is not — with really very satisfactory results indeed for the USSR. The stock of the Chinese, who have played their hand very badly indeed, has slumped heavily as a result of Soviet exertions in the past eighteen months.

Prospects

What chiefly do we notice about the policies of Khrushchev's successors? First, we notice that the revolutionary aims of Soviet foreign policy have not been entirely forgotten. The new leaders have firmly restated their belief in the correctness of what they call the "Leninist general line of the party," and we should be very foolish to overlook this. Second, they see the essence of Soviet foreign policy as being to strengthen the world socialist community, to support the so-called "national liberation struggle" and — of course — to safeguard world peace through peaceful co-existence. More significant, perhaps, is the new leaders' acceptance that only through "determined, unrelenting and painstaking work" and through "firmness and consistency"— to use their own words—can Soviet diplomacy regain the momentum which it had all but lost under Khrushchev. This would very much suggest that the sensational personal initiatives, the big and noisy gestures of the Khrushchev phase — which Molotov despised and which the former leader's colleagues came increasingly to fear — are definitely a thing of the past. At root, the new administration appears to be suggesting that its approach to world problems will be businesslike, less not more inhibited by revolutionary theory, active, flexible and, above all, prudent. At times, when we listen to the sort of language Khrushchev's successors are using, we may well wonder whether they haven't borrowed the whole of their vocabulary from President Johnson! If they have, then time alone will tell whether they have understood the meaning of the words they are now using and whether the life which they are at present trying to inject into the limbs of Soviet diplomacy heralds their rejection of the passiveness of many aspects of Khrushchev's approach to foreign policy, or the evolution of a harder and possibly more militant line. These seem to be the two main possibilities on the evidence to date. While it still seems too early to speak of a hardening, it is quite obvious that we shall have to meet a much more positive and more thrustful approach by the Soviet Union to world problems, but one that, for the time being at least, will be careful above all things.

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Danger in the Air

By J. R. Hickmott

IT is becoming increasingly apparent that Government policy over the last few years has placed in jeopardy the future supply of aircraft to the fighting services. The present position bears, in fact, an unpleasantly close resemblance to the pre-World War 2 period when it was considered politically expedient to ignore even the most obvious danger signals.

Both World Wars were preceded by a period of political vacillation and today's partial withdrawal of British support for U.S. action in Viet-nam must give similar encouragement to a potential enemy. The British action is significantly more dangerous when it is related to our dependence on the U.S. for military supplies and, in particular, military aircraft.

U.S. policy in Viet-nam may produce a reaction of isolationism in the U.S. itself, a principle never far below the surface of American public opinion. In this respect the British Government's declared opposition to the bombing of military targets in populated areas will add weight to the isolationist's argument that allies are not to be trusted. Perhaps what is more important is the precedent thus created which might be used to justify the non-supply of military equipment if U.S. public opinion considered our proposed usage distasteful.

France, as another potential supplier of aircraft, may prove an even less satisfactory source. There are many signs that Gen. de Gaulle would not be adverse to a Franco-Soviet non-agression pact and clearly such an agreement would limit French freedom of action in the supply of armaments to other nations. One obvious possibility would be a French demand for the withdrawal of all British support for U.S. action in Viet-nam as the political price for continued French co-operation in the joint production of aircraft. Indeed, the withdrawal of France from N.A.T.O. even to a limited extent would seem to be a part of a general process of cutting adrift from the U.S. and her allies in order to facilitate Franco-Soviet agreement.

It must never be forgotten that France suffered a humiliating defeat in Viet-nam long before the present conflict which Gen. de Gaulle, as a patriotic Frenchman and soldier, is not likely to forget. Could it be that the Communists have indicated a willingness to consider restoration of French influence in this area if France will first disentangle herself from the Western powers? Both China and Russia might see the value of such a move in the event of their own military failure. Whatever the intent a Franco-Soviet agreement could only be a complicating factor in Europe and, in particular, an effective reason for self sufficient British naval, military and air power.

There seems little strategic value in a British retreat from the Far East or the bases on route to that area. While such a process might reduce what are claimed to be over extended forces every example in history suggests that the ultimate result would be to allow an enemy to concentrate on the comparatively small remaining bastion.

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British history itself shows that our strength has almost always been in our ability to threaten an enemy or his satellites from widely scattered points throughout the world.

To suggest that atomic missiles have made conventional aircraft obsolete is only true if it is possible to accept that any attack will evoke a nuclear response. Methods of warfare such as poison gas, bacteriological weapons and nuclear devices must be looked upon primarily as deterrents. That is, they are weapons which because of their indiscriminate and widespread destructive powers can only be of value if possessed by one side only. This, in fact, suggests the paradox that despite these powerful weapons conventional military power is still the measure of a potential enemy.

Even if Britain is assured of support by allies it is still essential that her defence forces should be capable of holding an enemy for some weeks and possibly months. Our most dangerous period in the last war was immediately after the fall of France when potential allies stood back because our destruction seemed inevitable. Thus, lack of conventional weapons was not only a weakness in itself but an important factor in delaying the help we so desperately needed.

The availability of oil and natural gas within easy reach of our shores may diminish the practical importance of the Middle East but it in no way eliminates its strategic importance. It is the gateway to Africa just as Viet-nam and Borneo are the road to Australia, at least so far as the Communists are concerned. In order to fulfil our obligations it is essential that these areas remain free from enemy domination.

Communist strategy, upon present evidence, is based upon the use of conventional weapons and limited areas of conflict. One purpose of this is clearly to limit support for any Western power involved. For example, Viet-nam, where U.S. action is far from being universally supported by the West.

U.S. support for Britain in the Far East is based upon common purpose but it does not follow that such support would be forthcoming in other areas any more than it was at the time of Suez. Reliance upon such support at best limits our freedom of purpose and, if in addition we are dependent upon outside sources for a major part of our armaments, we become or may become an insignificant factor in world affairs. Furthermore, our continued existence as a national entity would depend entirely upon the goodwill of others.

If, as is sometimes claimed, our military resources should be of a purely defensive character it would suggest a main concentration on home produced fighters, medium and short range bombers. This does not eliminate the requirement of long range nuclear bombers or missiles but these alone would not be sufficient in number or suitable to deal with a conventional attack unless as previously suggested the use of nuclear retaliation is acceptable. If the present British Government is unable to accept U.S. bombing of military targets in populated areas it could hardly sanction nuclear retaliation against conventional attack.

Even if it is accepted that we have no effective defence against nuclear attack and that such an attack would bring complete devastation it cannot be argued that strong conventional forces are useless unless it can be shown that nuclear attack is inevitable.

(*continued on page 204*)

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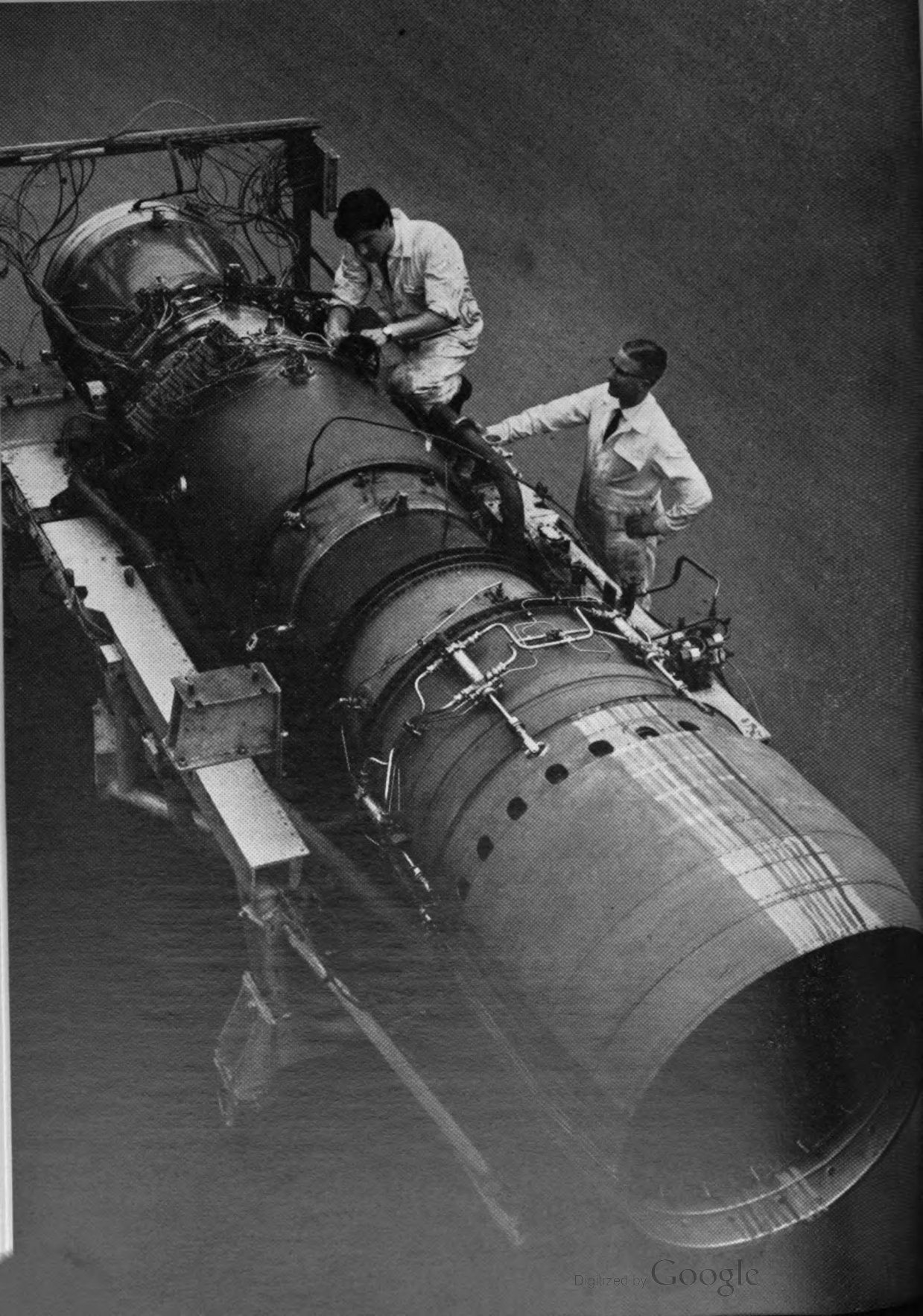
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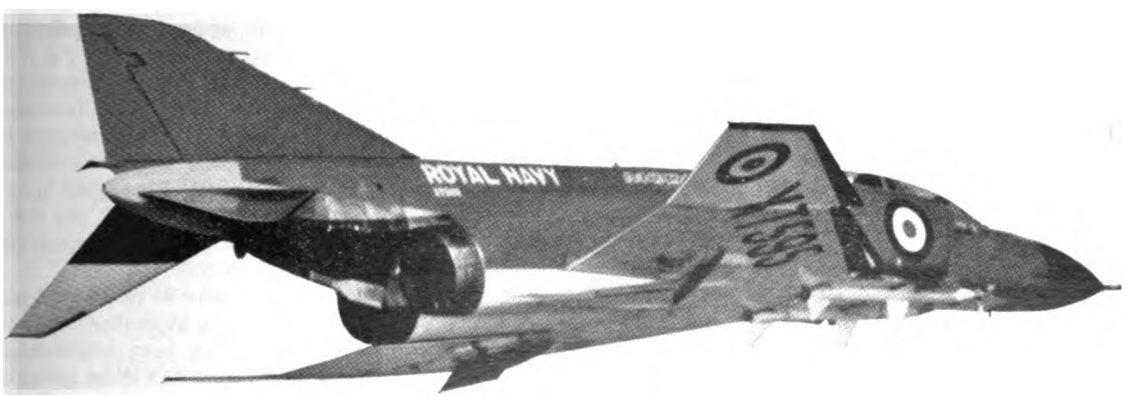
Rolls-Royce Spey Power for the McDonnell Phantom II



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Pictured here (left) under preparation for test running is the supersonic Spey-25 turbofan with fully variable afterburning.

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KARIBA DAM-RHODESIA

(EXPEDITION BY R.A.F. COLLEGE, 1961)

By Air Commodore W. O. Davies, M.R.C.S., L.R.C.P., D.P.H., R.A.F.

SIX cadets and one officer left R.A.F. College, Cranwell, on April 6th, 1961, on an expedition to the Kariba Dam in Southern Rhodesia. The visit was arranged through the Royal Rhodesian Air Force and its immediate practical aim was participation by the cadets in the rescue of wild life from the islands created by the flooding of the Kariba Valley with the waters of the Zambezi. The long term objective was the development of latent qualities of resourcefulness and initiative. This is a diary of the expedition kept by Air Commodore W. O. Davies, now Principal Medical Officer at Far East Air Force Headquarters.

Friday, April 7th

We landed at Kano (Nigeria) after a 9½ hours flight. Kano is hot, humid, flat, isolated, smelly, mosquito ridden, malaria infested and uncongenial. Its native waiters and porters are conditioned to seeing many American tourists and European executives. The 2s. 6d. paid to the boy who carried three small bags a distance of 300 yards was looked at with obvious disfavour.

We were prepared for signs of integration such as communal dining rooms, bars and anterooms. What we were not prepared for was the degree of intimacy which prompted a native waiter to approach the Squadron Leader of Flying Training Command, who had joined the party, and myself, in the hotel lounge and enquire whether either of us would be interested in a nice young black woman.

The consensus of opinion that night after seeing something of the " bright lights " of Kano, was that it was at its best viewed from a great height.

Sunday April 9th

We took off for Nairobi for the second time after engine trouble had forced our aircraft to turn back the previous day. Transport Command had managed to get a spare part flown out on a B.O.A.C. Britannia.

We had our first view of African wild game on the road from the civil airport to Nairobi. We saw giraffe, zebra, and antelope crossing the road. I think this introduction to game life gives a false impression of the bush. Through various means, largely by the provision of water holes, the game has been conditioned to living close to humans and to the outward aspects of civilisation.

Monday April 10th

We took off for Salisbury in a Royal Rhodesian Air Force Dakota, landing at Tabora (Tanganyika) to refuel. This was our first sight of real bush country. An

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African armed with a rifle sat on the grass outside the visitors' lounge. His job was to keep the airfield free of wild game.

Tuesday April 12th

Uniforms, dinner jackets, and all but essential safari luggage was left at Salisbury to be picked up on our return. When we landed at Kariba strip we were met by Rupert Fothergill, the game warden of the Department of Wild Life Conservation, and Graham Child, the wild life ecologist of the party.

Rupert Fothergill has been described as looking like an Australian backwoodsman. His normal dress is a bush hat, a pair of shorts, pair of tough canvas shoes and a sheath knife. We discovered very soon that his tough exterior and his taciturnity were combined with the most amazing regard and "feeling" for animals and the highest possible concept of the duties of a leader and host.

We were asked immediately if we had brought fishing tackle and food. When we answered "No," Rupert uttered sounds which I took to be an incantation to the Matabele gods to witness our stupidity. We loaded our equipment on to two Land Rovers and set out for the township of Kariba, at the top of a hill 800 feet above the lake and directly overlooking the dam.

I have omitted mention of perhaps the most important member of the party welcoming us at Kariba. This was Crackers, partly dachsund and partly a lot of other things, who seemed convinced that the decision to build the dam and so maroon a lot of interesting animals with fascinating scents was taken mainly for his particular benefit and to a lesser extent for the benefit of his master, Rupert. He tolerated most Europeans, including Cranwell cadets, worshipped Rupert and loathed Africans. He had a one track mind — the game track — and a tremendous sense of urgency. To him "walkies" meant "How about you and I chasing a rhinoceros for the next hour or so?

We embarked on two launches each towing three wide-beamed steel boats with each boat carrying eight or ten Africans. The scene on the lake was enormous — the vast expanse of the lake with the Northern and Southern Rhodesian mainlands on the horizon, the intensely blue sky and dark blue waters studdied at intervals with clumps of trees at various stages of submersion. The tree tops above the water line were bare of leaves and white with spider webs and cocoons. So dense were these webs that from a distance they were mistaken for white blossom. On close inspection they were found to contain myriads of gnats caught in their meshes. The spiders thriving on this artificial harvest were immensely fat.

Our first camp site was prepared by the Africans in little over half an hour. This entailed clearing the scrub, hanging large tarpaulins as shelters from the sun, erecting 13 camp beds and mosquito nets and four inflatable tents. The tents, intended as sleeping accommodation, we found too hot because they were badly ventilated. I felt that the British designer had never lived in the tropics, or perhaps what is more likely, had never intended the tents for tropical use.

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Within an hour of disembarking we were sitting down to our first sundowner. Later we dined on steak, onions, potatoes and peas. This indeed was camping-de-luxe.

We went to bed in as neat a line of R.A.F. beds as would gladden the heart of a Cranwell drill instructor — the bush to our left, the lake to our right, a Tilley lamp 50 yards away lighting the way to the lavatory and, just discernable, a loaded elephant gun alongside Rupert's bed. "Yes," said Graham, "that was elephant spoor you saw under the Tilley lamp, and fairly fresh too." For half an hour the silence of the African night was punctuated by the odd splash in the lake (hippo or croc?), the snores of the game wardens, and the slightly anxious throat clearings of the Cranwell party. Soon the frogs took command of the night air and we dropped off to sleep to the rhythmic beat of a bull frog.

Wednesday April 12th

I woke to the smell of coffee and the click-click of the African lark — the six o'clock bird. Rupert, Graham, and two cadets left on one of the small outboard motor boats to reconnoitre a neighbouring small island. The rest of us fished, drank tea, learned a little kitchen kaffir, and took refuge from the sun. After a lunch of cheese, onion and paw-paw we all made for the island. Sitting space in the small boats was a matter of squatting on petrol tins. With a shade temperature of 103 degrees F the sensation caused by sitting on these tins was that of the first painful seated contact with an overhot bath. The remedy was however close at hand — a mug of lake water thrown over the tin made conditions bearable. Two boats anchored offshore ready to go to the rescue of animals taking to the water. We rescued the only inhabitants of the small island, one water buck and two duiker. Before release on the mainland the animals were weighed, sexed, and ear-marked with a steel clip bearing a number. Each animal rescued was recorded in a log book.

Thursday April 13th

Today was spent in erecting nets over a large island ready for a drive tomorrow, and in rescuing two wart hogs, three zebra and four kudu from the water.

Releasing rescued zebra and wart hog was not without risk. It was advisable to have a pre-determined line of escape should the animal attack. Most of the antelope family lie motionless on release, apparently so worn out in their attempts to break their bonds that they become reconciled to loss of feedom. Not so the wart hog and the zebra. These animals are only too anxious to turn the tables. I had a very personal experience of being chased by a wart hog. Had I run as fast in my last appearance in a fathers' race I must certainly have won. Unfortunately the animal, having followed me into the water — I was heading unceremoniously for the boat — got itself entangled in the fork of a submerged tree trunk. Its tusks held it captive under the water and it was drowned before we could release it.

On the way back to the camp from the releasing point, an African pointed to a tree top above the water line and said that there was a snake in the tree. Graham told me that the Africans are so scared of snakes that they are constantly on the look out for them. If in negotiating water overhanging with trees in pursuit of game a

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snake is disturbed and falls into the boat, the natives dive overboard. So at least would one European.

Conversation after the evening meal ranged from ant hills (" If you put a snake in an ant hill, 48 hours later the only thing left is the skeleton ") to native labour.

Friday April 14th

We rescued one wart hog, four kudu, two impala and two duiker. One impala, exhausted from the run, nearly died. We tried to revive it with artificial respiration and cold water douches. Because of the intense heat, the impala was made comfortable in the shade of a tree, to be rescued at a later date. If it had been taken on the boat in its state of shock it would probably not have lived to see the mainland. In making it comfortable, care was taken to have it assume the posture it would normally assume at rest. Graham explained that this was done to keep the contents of the rumen, the first stomach, intact. The antelope are seriously upset if the rumen is allowed to drain. An injured antelope is therefore nursed not on its side, but in a sitting posture with head erect.

When everything that could be rescued from an island was saved and the island became submerged attention was directed to the tree dwellers, the baboons and the monkeys. We spent the late afternoon and early evening in this highly diverting operation. It combined elements of chess, cricket and water polo. The baboons and monkeys did not readily take to the water. They congregated in trees sufficiently adjacent to each other above the water line that they could swing from tree to tree. They reached the periphery of their confines only when the distance to the next tree outside their circle was too great for them to negotiate by jumping. The ideal situation in which to effect rescue was in a totally flooded area in which there were a few dozen trees still well above the water. Africans or Cranwell cadets were invited to lift themselves from the boats into the branches of trees outside the circle. A baboon would not make for a tree in which there was a human unless desperation drove him to it, and even then he would make for the portion of the tree furthest away from the human. The baboons and monkeys were then made to leap from tree to tree by shaking the tree in which they rested and scaring them with stout pieces of timber aimed not at them but at adjacent branches. Eventually they became reckless, missed a hold and fell into the water. Africans and Cranwell cadets retrieved them from the water, dropped them into sacks and deposited them in the boats. After such an operation it was important to count your cadets. One did not mind leaving a baboon in a tree but a Cranwell cadet was a different matter and in the failing light mistakes could be made.

Two baboons and two monkeys were taken back to camp and tethered to trees in the camp compound to study their social behaviour. Efforts to feed them resulted in one bitten African thumb and one clawed R.A.F. forearm.

Before turning in for the night Rupert entertained us with reminiscences of his life as a game warden. One story in particular impressed us, the story of a hunter who had his bed stripped of its bedclothes at night by a lion. Again the stillness of the night which precedes sleep was punctuated by an occasional nervous cough.

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Saturday April 15th

Rupert and I left early with three Africans to reconnoitre a small island to make sure that there was no wild life left on it. We rescued one gymsbock from the water.

Rupert explained that on the large permanent island the feeding habits of selected species of animals would be closely studied. The animal population would be kept at a suitable figure and special plants (e.g. the mulberry tree) would be introduced to supplement the island's natural vegetation.

Sunday April 16th

We sailed for a new camp site nearer Kariba. Changing sites was an operation much loved by Crackers who once he had worked out the assorted smells of a site wished to be off.

During our journey on the launches, Rupert left the convoy at intervals in one of the outboards to survey islands en route, the convoy meanwhile remaining at anchor. Crackers accompanied him on these jaunts and on return leaped from one to another of the eight boats as though on a tour of inspection. He was casting an eye over one of the towed barges when without warning the convoy started up again. Suddenly 10 feet of taut rope separated him from the towing launch and he was stranded in the company of his enemies, the Africans, with no hope of rescue for the next two hours. His whole frame registered his intense indignation. Eventually he settled for comfort and perched himself betwen two of the more sympathetic Africans.

After dinner we talked of witch doctoring. Rupert said that he preferred to keep an open mind on the powers of these men and their art. He said that when on occasion he had lost track of a rogue elephant he had been stalking for days he had, in desperation, consulted a witch doctor. The witch doctor had always put him back on the correct track.

Monday April 17th

The day was spent in surveying neighbouring islands. It was a day full of interest but no animals were rescued.

The weed Sylvania Auriculata which later caused so much concern on the lake — it spread over hundreds of acres — helped to create one of the most picturesque scenes to be witnessed at Kariba. It was intensely green and its growth so profuse that it formed a complete carpet about four inches thick over many parts of the lake. At that time it was confined to belts of some 400 yards off the permanent shores and around the island. Here water movement and currents were minimal. Partially submerged trees gave the appearance of growing directly out of the green carpet. The whole effect resembled closely views of Kew Gardens in the early spring.

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Tuesday April 18th

We set up camp on the mainland near Kariba, and spent the afternoon and early evening looking for islands of convenient size to work. We found nothing suitable but on one island Crackers flushed out of its hole a white tailed giant mongoose. This was a job which Crackers with the splay forepaws of the dachsund did well.

Wednesday April 19th

We rescued one sable, two water-buck and one duiker from an island a mile long and 200 yards wide, an ideal size for a rescue party of 50.

In the afternoon we cruised up the Sanyati gorge, the mouth of the Sanyati river. The banks of this river used to be a favourite haunt of the crocodile but with the rising of the lake water there were no longer muddy banks and the crocodile had retired further up river beyond the point where the river mouth was influenced by the rising waters of the lake.

On the return journey we saw a lone tortoise in the water some three miles out from land. A cadet dived in and rescued it. We decided to introduce him to Cranwell and call him Zam.

Saturday April 22nd

We emplaned in a Royal Rhodesian Air Force Canadair which was to take us the whole journey back to the U.K.

Conclusions

The Kariba expedition was, we thought, a great success. We saw a lot, did a lot, talked a lot, and got to know much about Africa, game and each other.

The object of developing latent initiative and resourcefulness was, I think, achieved besides other equally important things. Personal views were broadened, young men gained some idea of how large the world is and how manifold are the problems of living on it in peace, concord and understanding. Perhaps not the least of the hidden accrued assets of the expedition was that Cranwell cadets proved excellent ambassadors.

DANGER IN THE AIR — (*continued from page 195*)

The danger in the air today is not mainly from missiles, nuclear bombs or satellites but from conventional attack in circumstances which leave Britain standing alone, as so often she has stood in the past.

In conclusion it is necessary to ask the value of Anglo-French co-operation in the production of aircraft in face of the Franco-Soviet agreement on space research? Is it possible in such circumstances for France to allow Soviet technicians access to matters relating to space research and, at the same time, deny them similar access to details of conventional aircraft production?

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THE R.A.F. ASSOCIATION AND ANNUAL CONFERENCE 1966

By The Editor, *R.A.F. Quarterly*

EX-SERVICEMEN FORM "THE COMRADES OF THE R.A.F."

THE R.A.F. Association is young like the Service it supports and from which it gains its strength, now approaching a membership of 100,000, although its history is a short one.

After the First World War squadron and unit re-unions provided the means of preserving war-time comradeship. In 1930 a move was made to amalgamate these small Associations and in 1931 "The Comrades of the R.A.F." was formed and was the foundation upon which was built the world wide "R.A.F. Association" of today. Many of the founder members of the R.F.C., R.N.A.S. and R.A.F., despite their three score years and ten, are still keen workers and leaders.

Between the two World Wars, although small in numbers, they overcame many difficulties and steadfastly upheld its principles of good fellowship and comradely help to ex-Servicemen and their dependants who were in need.

At the outbreak of the Second World War, with a membership of only 14,000, it was clear that when this ended they would be faced with a challenge of overwhelming significance. The need for their help was going to be enormous.

EXPANSION OF THE ASSOCIATION

In 1943 the Comrades of the R.A.F. merged with the Old Comrades of the W.R.A.F. (formed in 1919) and formed the R.A.F. Association. In 1943 the Air Council gave recognition to this Association and membership was extended to serving personnel.

THE AIM OF THE ASSOCIATION

The aim was stated as—the promotion of the welfare of those serving or had served in his Majesty's British or Commonwealth Air Forces and their dependants.

As the first principle of the ten Principles of War is "The selection and maintenance of the aim", which should be defined with absolute clarity, the clarity of the aim of the Association and its maintenance throughout its existence has been in keeping with its military background.

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THE CONFERENCE IN SESSION

The Lord Tedder (central figure) with Vice-Presidents, the Chairman and Members of the Council and many other important personages on the platform; face the hundreds of delegates in the main body of the Conference Hall.

Rank after rank of some three hundred standards.

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The greater part of the Association's charitable welfare work, bringing help to comrades, their wives, widows and children, obviously cannot be known to others than those concerned. However, such lovely homes for the disabled and convalescents as "Sussexdown" standing in several acres of beautiful grounds in West Sussex and "Richard Peck House" in the pleasant residential area of St. Annes-on-Sea, stand as monuments to the devotion of the Association to those in need.

The Association has many activities in addition to material aid to those in need. Among these are the preservation of the memory of those who have died, advice of every kind regarding pensions, visiting the sick, supporting The R.A.F. Benevolent Fund and other charitable organisations with similar aims, etc. In the space available for this article it is impossible to include the wide field of activities which the R.A.F. Association covers. Outstanding among their work is the enormous task of obtaining the necessary large funds which enable them to maintain their aim of meeting the ever increasing demands for help.

MEMBERSHIP

Membership is open to all serving and ex-service officers (male and female), airmen and airwomen of the R.A.F., its reserves and auxiliaries; as well as those of the Dominion and Colonial Air Forces. The potential for increasing the membership is enormous, with 127,600 officers and men now serving and hundreds of thousands of ex-R.A.F. personnel the present 94,051 members could be vastly increased. The result of which would be to extend the aid now being given to our comrades and their dependants who are in need of help.

Among this large number of potential members there may be many who are not aware of the benefits available to them, both now and in the future; the comradeship and facilities offered by the many excellent clubs at home and abroad, the ever ready help when in need and the satisfaction, if not in need, of helping those comrades and their dependants who are.

Should there be any among our readers who (perish the thought) have not even heard of the R.A.F. Association, it is hoped that this article will remedy their state of "not being with it" and interest them sufficiently to seek immediate membership.

THE ANNUAL CONFERENCE 1966

What follows is not for those two thousand delegates and their friends who attended the twentieth Annual Conference at Harrogate on 11th and 12th June or those who have been present at similar ones: they know more about it than the writer of this article. This is an attempt to provide a picture, however lacking in detail, of what transpires at these Conferences for those of our readers who have never had the good fortune to witness one.

One's mind boggles at the thought of the administrative and organising ability required to prepare for a conference of 2,000 people from all over the world. The enormity of the task is indicated by the fact that preparations for the 1967 Conference had begun before the assembly of that for 1966 and continues all through the ensuing

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year. Even those who have attended many such occasions never cease to wonder at the apparent smoothness with which everything works. Only the organizers know of the numerous snags that arise, some seemingly unsolvable are dealt with, others swept under the carpet until the Conference is over.

To see the General Secretary (Gerry Boak) the architect of it all, sitting back in an easy chair in one of the many hotels, quaffing a glass that cheers, you might easily mistake him for one of the principal guests so tranquil and so undisturbed is he, while the hustle and bustle of the entertainment and business is in progress. His deputy (Johnnie Johnson) and other members of the staff seem equally calm; which is all a sign of the thoroughness and attention to detail which they have devoted to the task earlier.

The Annual Conference has three facets (1) Entertainment, (2) Ceremonial and (3) the most important—the serious business.

(1) ENTERTAINMENT

The delegates, their friends and other guests arrived on the Friday in a never ending stream and made their way to the hotels already alloted to them. At 8 p.m. a wonderful opportunity was provided to meet old friends and make new ones at the Rendezvous Dance in the Royal Hall, which was soon overflowing with members in every state of jollity. Here and there could be seen small groups engaged in excited debate, no doubt lobbying for some resolution being put forward the following morning. The Master of Ceremonies in his pink coat did a wonderful job of work in maintaining a semblance of order and encouraging the dancers or stimulating the jovial mood of the occasion. The democratic nature of the Association was upheld by the presence of Air Chief Marshals, Air Marshals, Air Vice-Marshals and members of the Council on the dance floor, all of whom seemed to have the gift of finding the prettiest partners. During that evening many trophies were presented to the winners of several national championships.

After the more serious business of the debate of the many resolutions from 9.30 a.m. to 4.45 p.m. on the Saturday there was a further opportunity for relaxation in the evening at the Civic Reception given by the Mayor and Corporation of Harrogate in the Royal Hall. Breathing space was given to the dancers by a professional entertainer—his tricks requiring the assistance of members caused particular amusement. There followed the final of the "Miss R.A.F.A. Competition" when from among a galaxy of beautiful girls from the eight Association Areas the panel of judges selected a worthy winner in Miss Linda Burton of the South Eastern Area; their judgement being confirmed by the burst of applause which followed it. Having been crowned she received the now customary additional award from Air Chief Marshal Sir John Baker!!

(2) CEREMONIAL

It has now become traditional that each Annual Conference is opened by a short impressive ceremony when the Standard of the Association is paraded into the Hall, taking a central place during the short Service of Dedication and is then handed to

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the President of the Association, after which it is placed in a position of honour at the back of the platform among the many Standards already in position; where it remains until the end of the Conference. This ceremonial was preceded by those whose precedence from their various offices dictated their presence on the platform, taking their seats, followed by the entry of the President of the Association Marshal of the Royal Air Force The Lord Tedder whose entrance (now in a wheel chair so sadly disabled is he) brought a burst of applause and a standing ovation from all present which must have lasted at least five minutes. It was a very moving occasion. At his request the Vice-President Air Vice-Marshal Sir Geoffrey Bromet then took the Chair and the business of the Conference began.

On Sunday morning the customary Parade and Memorial Service took place at the War Memorial. This was attended by The Lord Tedder, the Mayor and Mayoress and many other distinguished guests. This was indeed a most impressive ceremony. Those assembled around the War Memorial could hear in the distance the beating of the drums and the tramp of hundreds of marching delegates accompanied by the martial music of the R.A.F. Band. Very shortly afterwards appeared rank after rank of some three hundred branch Standards flying gaily in the breeze. This brought everyone to their feet and every hat was removed as the Standards came abreast of the War Memorial. The bearing of the Standard Bearers and marching of the delegates was a credit to the best traditions of the Royal Air Force. The Service was brief and the Hymns were sung lustily by all present. After the National Anthem and Blessing the parade marched off and another moving ceremony of the 1966 Annual Conference was over.

(3) THE SERIOUS BUSINESS

After the Address of Welcome by His Worship the Mayor of Harrogate (Councillor Eric E. Potter, J.P.) and the reply by Marshal of the R.A.F. The Lord Tedder, G.C.B., D.C.L., LL.D., the serious business of the Annual Conference began at 10 a.m. on Saturday. A formidable list of 33 resolutions were scheduled to be dealt with by 4.45 p.m. and a further 21 on the following Sunday morning. To enumerate these in full is not possible in what started to be a short article and has now already over-run the allotted space.

It would be a mistake to imagine that the seriousness of the business under discussion made this a dull affair—far from it. The obvious zeal, forcefully put resolutions and lively arguments held everyone's attention. Orators, well known from other conferences, added a spice of amusement and sometimes hilarious laughter from the assembly, which from beginning to end prevented any sense of boredom.

* * * *

To attempt in the space available to provide anything like a complete picture of this annual Conference was to the author a forlorn hope from the beginning. From the time the request was made he was aware of his inadequacy to do such an momentous subject justice; but if he has been unable to produce a complete picture, he hopes he will at least have conveyed something of the enormous task facing the Association, the great work that it is doing and the need for ever increasing membership, if it is to maintain the worthwhile aim of this very valuable Association.

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VV7

While the world sleeps or works or plays, Victors are ready—waiting to fill any of their three roles as missile carriers, reconnaissance aircraft or nuclear bombers. A single sortie by four Victors can map the whole of a continent. At three minutes warning Victors can be airborne, retaliating against an aggressor country, carrying weapons with the destructive power of many million tons of TNT. In the face of such a deterrent, sanity decrees that global war is now unthinkable.

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THE CRANWELL HOVERCRAFT

By Under Officer R. Dixon

INTRODUCTION

In 1960 at about the same time as the Saunders-Roe Hovercraft, SRN1 first hovered, work began at The Royal Air Force College on the design study for a single seat hovercraft. The studies progressed slowly until early in May, 1961, when Saunders-Roe fostered the interest. With such a ready source of information and encouragement the design study was well advanced by July, 1961, and a model hovercraft was constructed. The model hovered well and proved very useful to test design features. The design specification was quite simple: a single craft that would hover in a stable condition at about six inches and, with modifications, be capable of low forward speeds with adequate control.

The hovercraft principle is basically the formation of a peripheral air curtain to contain an air cushion at sufficient pressure underneath the craft to support it.

EARLY DAYS OF DESIGN AND CONSTRUCTION

It was decided that the craft would be 12½ ft. long, 8½ ft. wide and weigh approximately 800 lbs. British Industry provided most of the materials and, after many hours of gas welding, the tubular steel skeleton took the shape of the basic space frame.

Eventually CH1, with impeller installed, engine mounted and transmission connected was ready for engine trials early in the New Year of 1963 These initial tests showed that the engine, its mounting, the transmission system and the impeller installation were all satisfactory.

An oil temperature gauge was fitted and displayed on the pilot's instrument panel together with a tachometer, which incorporated the twist grip throttle and an engine cut-out button. A clutch pedal completed the pilot's engine controls.

The craft was designed for amphibious operation so provision had to be made for it to float. Consequently a large buoyancy chamber was built into the lower half of the space frame. Expanded polystyrene covered with special protective paints and glass cloth was used to form this chamber, which also acts as the lower ducting to guide the airflow. Sheet polystyrene was used as the upper ducting, forming the outer skin of the craft. It was this ducting that would guide the airflow radially from the impeller, through the diffusion region and into the convergent nozzle around the periphery of the craft. This produces the air curtain which is directed inwards at a given angle (the jet angle); for CH1 this was 45°. A small air intake lip completed the ducting.

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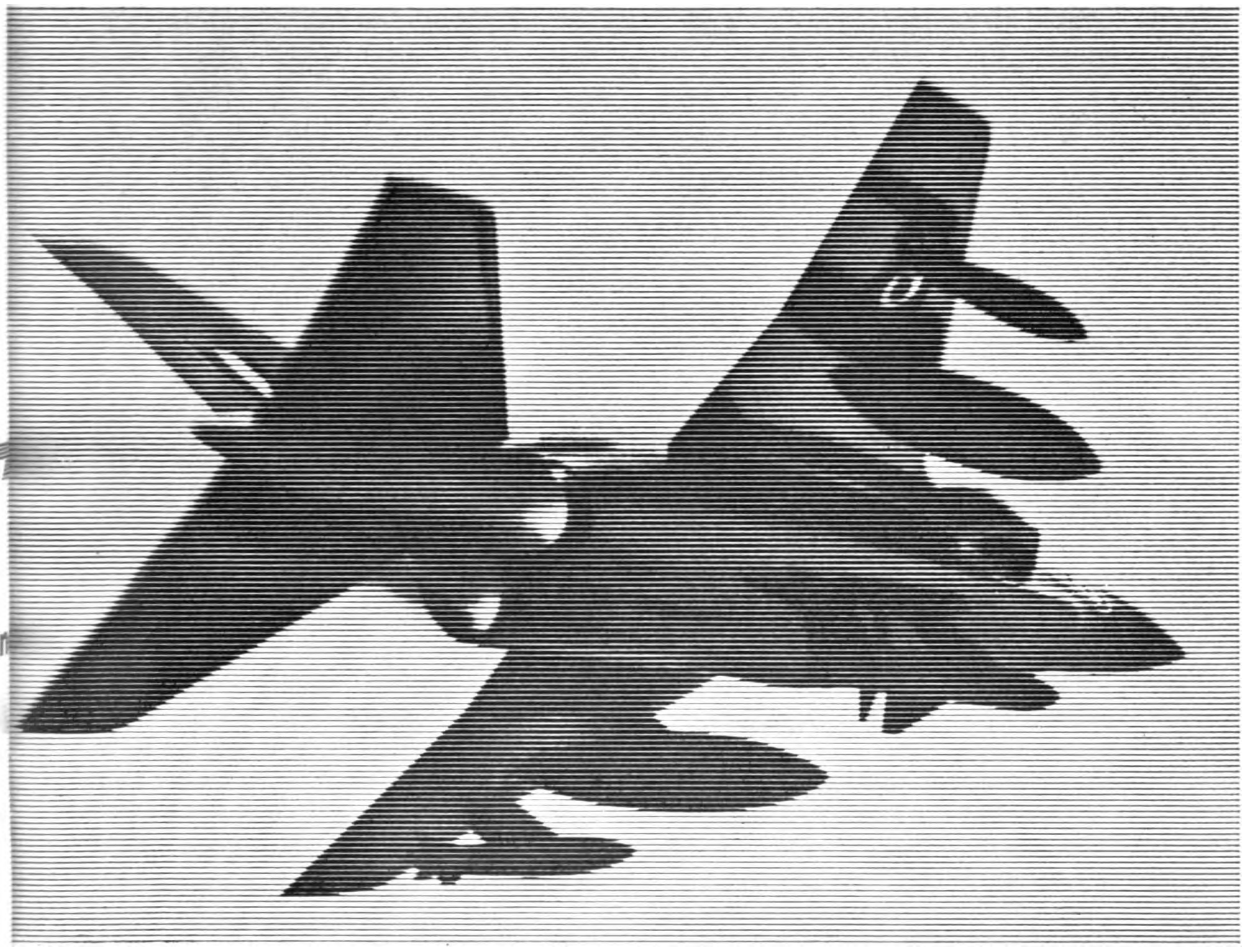

+ 150% interception radius

+ 50% ferry range

− 33% take-off distance

+ supersonic at all altitudes;

+ advanced training in two seater version

Breguet Aviation **British Aircraft Corporation**

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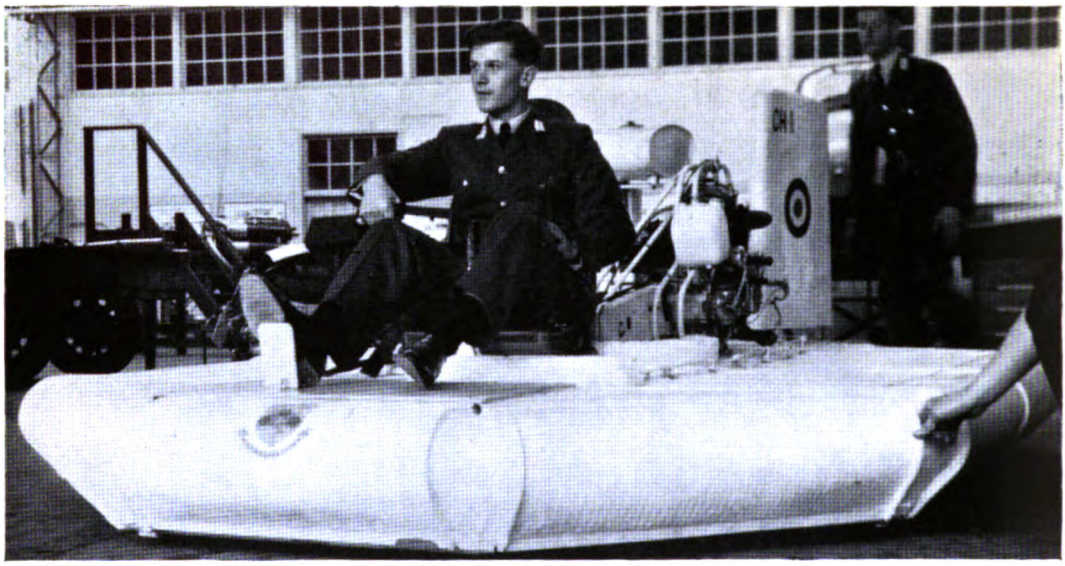

CH-1 WITHOUT 'SKIRTS'
(PILOTED BY UNDER OFFICER DIXON)

FIRST FLIGHTS

The idea of CH1 had taken two years to materialize; from "drawing board" to "maiden hover" took just one year.

By the 4th May, 1963, all was in readiness to test the theory and construction. The first hover was satisfactory — the hoverheight varying between ½ inch and 2 inches. The tilted altitude was due to the incorrect positioning of the pilot's seat. Other problems that were immediately obvious were the vibration and over-heating of the engine.

After minor modifications the craft hovered satisfactorily at 4 inches and was quite stable.

THE INTRODUCTION OF "SKIRTS"

At this time we were considering using a 'skirt'; a peripheral flexible curtain to achieve a greater hoverheight. A five inch single curtain was incorporated and tested. The 'skirt' flapped and tore slightly, but demonstrated by the increased hover-height that further designs would justify themselves on the craft. A more advanced 'skirt' was then designed and attached over the duct.

In January, 1964, the 'skirt' was tested with results far exceeding the expectations of the constructors. After several tests 5 people were easily lifted to the full hover-height of six inches. Stability was excellent even at the maximum tested load of ¾ ton (all-up weight). One problem created by the new 'skirt' was the increased drag due to the actual contact of the 'skirt' with the ground. This drag accentuated the general problems of propulsion and control.

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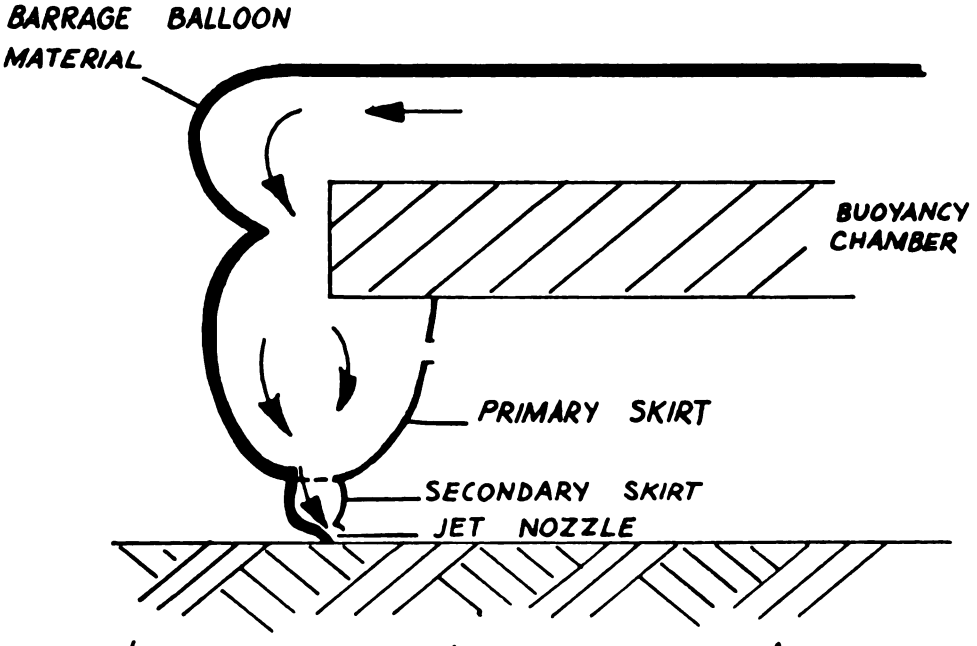
To see the effects of a large 'skirt', a 3 foot one was made and tested. Although the craft 'rose to the occasion', it was only neutrally stable, and any consequent displacement of the pilot, or movement forwards, produced alarming pitching movements. The hoverheight was therefore reduced to 1 foot 3 inches; the 'skirt' being made of dinghy fabric.

PROPULSION

When the craft was first constructed no definite plan for propulsion was drawn up. As a result the efforts to propel the craft have been laborious and time consuming. The designer of the original craft, Under Officer Green, saw his theory vindicated when the craft lifted off the ground—but the propulsion was the work of Senior Flight Cadet Mathie. His first 'system' was built round a 175 cc BSA engine. The propellor was made from a piece of duralamin and driven by a bicycle chain. The engine and propeller were mounted behind the lift engine and directional movement was obtained by a rudder constructed from a scrap Valetta flap. However, when tested, the engine proved too small for use, and success was limited.



'1965 MODIFICATION' – 'DOUBLE BUBBLE' TYPE

CH1 REBUILT

Under Officer Gurney and Flight Cadet Holder produced the new modification design which was completed by July, 1965. The lift and thrust engines were removed and the top surface stripped off. The buoyancy chamber was squared and an aluminium sheet was made to protect the whole undersurface from damage. The polystyrene outer skin was replaced by barrage balloon material, and a new

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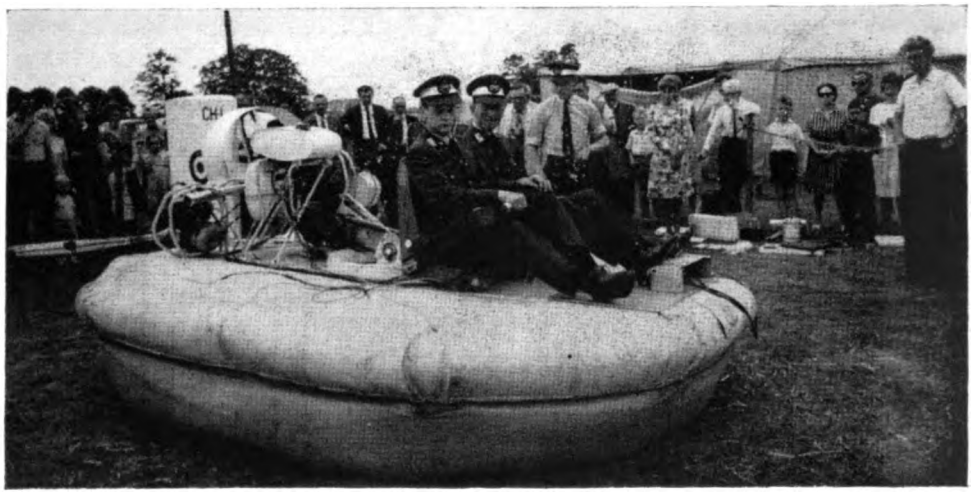
improved 'skirt' was attached. This 'skirt' was a 'double-bubble' type which gave much more stable flight and needed less power to inflate it. The 650 cc BSA engine was overhauled, and BSA provided a new 250 cc propulsion engine. The modification proved very successful and five people were lifted to the full hoverheight of 1½ feet. The lessons learnt were now ready for incorporation in the new machine, CH2.



CH-1 WITH 'SKIRTS' AT THE SLEAFORD SHOW IN 1964

PUBLIC DEMONSTRATIONS

Before leaving CH1 mention should be made of the interest shown in the craft when it was on show. These demonstrations had to be limited because they delayed the main object of the craft—experimentation.

The first Public 'hover' took place on the 14th June, 1963, in the Embankment Gardens outside the Air Ministry. The demonstration was well covered by the National Press.

On Whit Monday, 18th May, 1964, we were ready to give a Public display. We therefore accepted an invitation from the Royal Air Forces Association to demonstrate the Hovercraft at the Hucknall Air Display. The display was successful, despite an over zealous young enthusiast putting his foot through the craft in the early afternoon!

On August Bank Holiday, 3rd August, 1964, the craft was demonstrated at the Sleaford Agricultural Show. Several people 'flew' in the passenger seat, including the College Commandant and Mr. Joseph Godber, who was Minister of Labour at the time. The craft had trouble when an oil leak developed, but this was sealed with wire and chewing gum! The exit from the Show was auspicious in that a 30 - 40 foot column of dust rose into the sky as CH1 went through the main gate!

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The following Friday, 7th August, 1964, was marked by the arrival of a BBC Television Unit to film the Craft at the College. This was screened on the next Monday and the Hovercraft Group became known to many people who corresponded with the Society giving advice and asking for information. The range of correspondence now stretches from the USA to Italy and Sweden, and comes from both manufacturers and private individuals.

Several times the craft has been shown at local shows — including the Royal Air Forces Association at Sleaford, and the Ruskington Show. All have indicated the considerable public interest in the Hovercraft and in its future

THE SECOND CRAFT

Parallel with the tests on CH1, the designing of the experimental new craft CH2 proceeded apace. Based on experience gained on CH1, the craft has advanced constructional design ideas with an emphasis upon simplicity of construction, lightness, strength, and stability. The original design of the first craft was largely the work of one man, but CH2 has always been a joint effort with the new members of the Group having an equal say. Inevitably the shape of the craft is already becoming dated, but the method of construction and many other features are level with the large Industrial Firms in their conception.

It is the aim of the Group to produce an amphibious machine with good control characteristics in the low and medium speed ranges (from 0 - 60 knots).

The frame is a box structure and is made from aluminium alloy angle bar. It is bolted together to facilitate modification and transportation. The buoyancy chamber is expanded polystyrene (as in CH1) and the undersurface is covered with a dural sheet. It is designed to accommodate a 5 foot radial-flow impeller mounted in the centre of the frame.

A gas turbine 60 hp engine has been provided by Rover Gas Turbines Ltd., and this engine will be used to lift the craft. The thrust engine has not been finalised at the time of writing, but it will drive a propeller mounted at the rear of the craft.

Extensive use is being made of flexible materials for the upper surface (provided by Dunlop), for the 'skirt', which will be of dinghy fabric (as were the later 'skirts' for CH1); and for cross-skirts which are a heavy Dunlop material. Cross-skirts are used under the craft to prevent the movement of air from one area to another thus causing instability. The 'skirt' itself is to be a 'double-bubble' type and will give a hoverheight of 2 feet.

The Cabin will accommodate Pilot, Engineer and 2/3 passengers. The occupants, engines and fan will be enclosed by an aluminium covering. A model has undergone smoke tunnel tests to indicate the required shape to facilitate maximum flow to the impeller, and the basic framework of the Craft itself has been completed.

HOVERCRAFT IN THE FUTURE

The future of the Hovercraft in both the Civilian and Military fields is potentially very bright. The diversity of roles it can perform is striking, and the early passenger runs and operations in the Far East are justifying the faith of those who first saw the potentialities of such a craft.

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The use of high speed Car Ferries, Passenger Ferries and Cargo Carriers has obvious applications throughout the world. The 100/200 ton Hovercraft travelling at 80 knots over short range routes (i.e., up to 100 miles) is required for many routes especially in areas where ports are non-existent, or the sea approaches are fraught with underwater obstacles.

The most vulnerable part of an amphibious landing of troops is the distance to be travelled from the waters edge to cover. A Hovercraft in the landing craft role would obviate removal of anti landing underwater obstacles, and would land the troops at the cover itself.

The operation of the Hovercraft on Patrol Boat duties is being proved in the Far East. Its high speed dash, manoeuvrability, and disregard for obstacles, allows up river as well as coastal patrolling.

The high speed of the craft, 80 - 90 knots, makes it ideal for inshore minelaying and for torpedo-boat duties.

Having no draught the Hovercraft is almost immune to torpedo attack, and is therefore very highly suited to a short range anti-submarine role. Any movement of the craft cannot produce the 'noise' easily heard by the submarine Sonar. The high speed dash capability makes it as uesful as a helicopter for interception, but able to carry a much greater weapon load for the 'kill'.

The Royal Air Force is also looking into the possibility of using the hovercraft principle—to a limited extent—in its specialised vehicle inventory. The application to the Fire Tender and Crash Rescue Vehicle would be invaluable on airfields with marsh, water, or low obstacles on the perimeter.

We at the Royal Air Force College, Cranwell, may not solve all the problems facing the Hovercraft Industry. (These problems include the efficiency of Propulsion Systems, low speed control and the reduction of noise levels—to name only a few.) We intend to try and contribute towards these problems, and to learn more of this new form of transportation which is only five years old.

"Tempora mutantur nos et mutamur in illis"

THE R.A.F. QUARTERLY AND OFFICERS CAREERS

It is hoped that those responsible for the training of junior officers will draw their attention to the fact that each number of "THE ROYAL AIR FORCES QUARTERLY" contains articles helpful to them in their preparation for Promotion and Staff College Examinations.

These articles are not only made "Recommended Reading" for these examinations in the United Kingdom, but also in the Commonwealth air forces and those in the U.S.A.

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PROGRAMMED LEARNING

By Squadron Leader A. E. Cartmell, B.A., R.A.F.
Research Unit, Royal Air Force School of Education

ONE of the most important innovations in education and training in the Royal Air Force during the last year, has been the use of programmed learning on a much wider scale than hitherto. Teaching machines were first used in experiments at Yatesbury in 1961 and at Melksham in 1963 to test the validity of the claims made for programmed learning in the United States of America. Now, however, airmen are studying for GCE 'O' level in mathematics and for the Royal Air Force Education Test in science by means of programme, and four teams of officers and NCO's are writing programmes for use in technical training. It seems that programmed learning has come to stay.

Much of the publicity has over emphasized the importance of "teaching machines." This is indeed unfortunate for, although teaching machines of varying complexity might be used to present a programme, it is the programme which is all important in ensuring that a student learns. Without it the machine is worthless. Indeed, perhaps the most important aspect of programmed learning is that it focuses attention on the learner rather than the teacher. In essence, a programme is a carefully prepared course of study through which a student works by himself according to the directions laid down in the programme. The subject matter of the course is broken down into a series of suitable steps arranged in such a way that learning will take place. At each step the student is given a piece of subject matter and is asked to respond to it by answering a form of question, e.g. by completing an equation or sentence, or even a piece of practical work. After each response the student is told whether he is right or wrong and is directed to the next step [see Figure 1 on next page]. The student takes a test before he starts the programme, works through the programme one step at a time and is given the same test at the end so that, by comparing the scores on the two tests, actual learning can be measured. Thus, the use of programmes overcomes many of the deficiencies of conventional classroom teaching for a teacher can never be sure that the pace of the lesson is the correct one for all the students. Nor is he able to question each student to ensure that the significance of each part of the lesson has been grasped. Thus much that is left to chance by a teacher dealing with a class of, say thirty students, is catered for in a programme.

In many ways, using a programme is like working with a personal tutor who guides a student through a lesson ensuring that every point is driven home. Programmes are tailored to suit the needs of a particular type of student and experiments have shown that students learn far more from a programme than from a conventional classroom lesson. The significance of this has not been lost in education and in training for industry, particularly the latter. The Central Training Council has given its blessing and many firms including British European Airways have introduced teaching machines and programmed learning into their training.

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FIGURE 1
A typical frame (step)

FRAME	RESPONSE
1. Diagram 1 shows a uniform beam of length 12 ft. and weight 12 lbf. Since the beam is uniform the weight is evenly spread along its length, and if it is divided into six equal sections each section will weigh	2 lbf.

The response is covered until the student has answered the frame.

At a time when equipment in the Royal Air Force is becoming increasingly complex and, therefore, needing a correspondingly high standard of maintenance, programmed learning has much to offer in increasing the efficiency of training. One can envisage in the future much of what is currently taught by the teacher being presented by programme, possibly on a teaching machine. This is not to say that it is possible to dispense with the teacher in such circumstances. The teacher is an integral part of the system but, where programmes are used he adopts a different rôle, acting more as a tutor than as a teacher and using his talents to develop material taught by the programme. However, it is not easy to determine exactly how much of a course will be programmed and how much will be devoted to tutorial or practical work. Decisions of this sort can only be made when a programme is written.

Programmed learning is being introduced into the Royal Air Force in the General Education Scheme, continuation training and in certain areas of technical training. In the first two, problems of leave, shift work, detachments and postings have always made it difficult to maintain attendance at formal classes on stations. These difficulties can be overcome by the use of programmes so that the content of the course can be studied in private, possibly at home, with the knowledge that a teacher is available if help is needed. This method of study also has other advantages for older students who are often embarrassed to find themselves in a class with much younger students and are afraid to ask questions because they might lose face if the question is one which has an obvious answer.

In formal technical training it will be used to help those students who, for some reason, have not kept pace with the rest of the class. It will also be used to try to bring about economies in the cost of training. This can be done by programming existing short courses and the lead-in parts of longer courses. The programmes will be used by students on their units and the courses themselves cancelled or shortened as necessary. Thus the number of instructors needed will be reduced and the wages of students who would otherwise be away from productive work, will be saved.

Although programmed learning can offer rich rewards in terms of both increased efficiency in training and economy, it cannot as yet be used on a wide scale because

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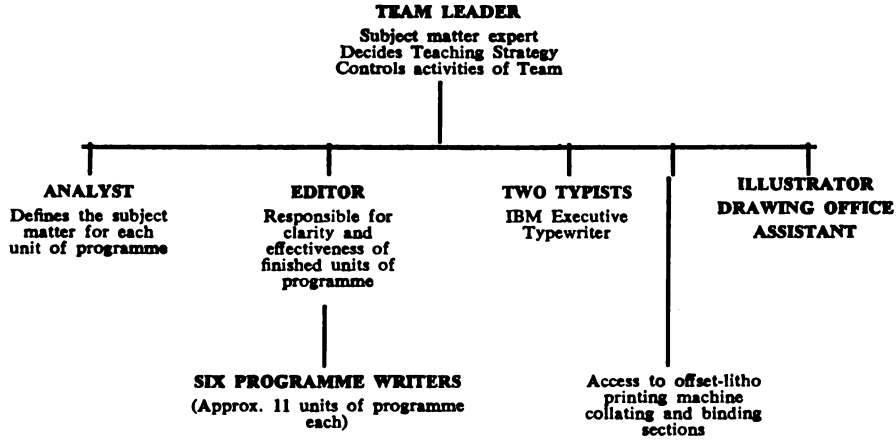
of the scarcity of suitable programmes. It seems unlikely that commercial organisations will write many programmes suitable for Royal Air Force training, and experience has shown that the unco-ordinated efforts of individual programme writers will only produce programmes for local needs. Programme writing is time consuming and requires specialist knowledge and validation facilities. It seems that the only way of producing programmes to cover a whole syllabus is by using a team such as the one shown below in Figure 2.


TEAM LEADER
Subject matter expert
Decides Teaching Strategy
Controls activities of Team
ANALYST
Defines the subject matter for each unit of programme
EDITOR
Responsible for clarity and effectiveness of finished units of programme
TWO TYPISTS
IBM Executive Typewriter
ILLUSTRATOR
DRAWING OFFICE ASSISTANT
SIX PROGRAMME WRITERS
(Approx. 11 units of programme each)
Access to offset-litho printing machine collating and binding sections

Five such teams have been trained at the RAF School of Education in the last year. The first of these was composed of education officers who wrote a science programme to prepare students for Pt. II of the RAF Education Test. This programme consists of 60 sections each of which takes an average of one and a half hours to work through. The other four are mainly staffed by NCO's and are engaged in writing programmes for use in Technical Training Command on subjects such as the following: Special Safety — Airmen (2 day course); Clerk Secretarial (6 week course); Supplier General (8 weeks); and the lead-in parts on electrical, electronic and airframe mechanics courses.

The main consideration in all this is the programme. It does not mean that electronic teaching machines will be much in evidence in our classrooms in the near future. For the time being, the programmes, which will be in book form, will be presented to students in simple plastic folders for this will enable students to take their programmes home, on leave or on detachment. However, the value of machines in the General Education Scheme is currently being assessed by the School of Education using a mathematics programme, and further experimental work is planned in Technical Training Command.

Programme learning has an important part to play in formal training, continuation training, in the General Education Scheme and in RAF children's schools overseas. It is not, however, a universal panacea and a great deal of research is needed to find those areas in which it is most applicable and how best to integrate programmed learning with other methods of instruction such as films, closed circuit television, language laboratories and class room teaching.

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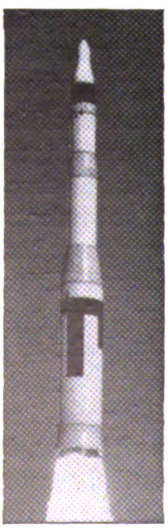
more than 1,320,000
continuous minutes of operation



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"R.A.F. (Ret'd)"

By Group Captain E. J. Tippett, B.Sc., Ph.D., R.A.F. (Retd.)

The calm and peaceful waters of "Retirement"

A DINING-IN NIGHT, when an officer is "dined-out" on his retirement from the Royal Air Force, is usually a heart-warming occasion. The retiring member of the mess is extolled as a paragon of an officer, everyone likes him (for the moment, at any rate), and wishes him well; some feel that he is to be envied, while others experience a vague sense of foreboding. We all know that what is now happening to Tom, Dick or Harry, will come to us in due course, but "Not to worry," our turn is comfortably distant (through the haze of conviviality, if not in "real-time"), so eat, drink and be merry, for tomorrow we go on parade, and we needn't worry about retirement for ages.

But in point of fact, we have been thinking of this for years. As young officers we were aware of the distant event as something inevitable, looming mistily in the future, but not warranting any real attention. Then in mid-career, when we were seeing so many of our immediate superiors and colleagues go out, we began to give the subject a little more positive thought, but still perfunctorily, until within a few years of the occasion, it began to assume a more dominant role in our thinking and planning. Finally we had to take positive steps to achieve whatever we had established as our aims.

For very senior officers of some eminence there would seem to be very little problem. They are eagerly sought after as company directors, society presidents, local bigwigs and in other capacities in which they can be either useful or decorative, or both. If they are just very senior but not eminent, their services are in little demand, and their problem is a very real one. And for the officer who retires young, there is

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no option. He MUST get a job as a civilian, but his youth and experience will enable him to do this with little difficulty. But what of the average officer over 50?

In his late forties he probably thought that all he wanted on retirement was leisure. His pension would enable him to rub along and he could buy his house with his gratuity. Or if he did think in terms of working, it was probably as the owner of a small country pub, where he would be a hospitable "mine-host" (helping to keep his income tax down by joining freely in the conviviality), or as a village postmaster and general storekeeper, selling postcards, pins and pinnafores; soup, soap, sponges, string and stockings; boot-polish, beans, bacon, bread, and butter; cups, custard, cabbages, corsets and curlers; tea, turnips, toys, toothpaste and tobacco; and the hundred and one other things which are obtainable at these fascinating places. And he saw himself making huge profits, like old Bill who took that post-office and store at Mulberry-in-the-Muck, but without working himself to death like old Bill. That would not be necessary of course—all you need is efficiency!

But whatever he thought at 47, he is likely to feel differently at 55 or 60, just as the small boy is quite sure at six that he wants to become a bus-conductor, only to find himself articled to a solicitor when he has grown to a young man. The officer who earlier looked forward to some really active post-retirement occupation, is apt to find himself wanting nothing but leisure and freedom from responsibility when the time comes; while the one who pictured himself growing gracefully into old age pottering about in his workshop, tending his roses, digging his garden, fishing, golfing and generally doodling, may well find such an aimless existence unthinkable when he is actually threatened with it. Even his early ideas as to where he would like to live may change. That seaside resort which seemed such a charming place in which to settle when he stayed there while on leave some years ago, may now prove unbearably brash and popular in his mellower years; or that delightful country village which was so relaxing after a harassing tour of duty at the Air Ministry, might prove insufferably quiet and remote now that he is no longer able to get back into the bustle and excitement of busy life from time to time. However, the officer has to make a decision eventually as to how he is to spend his retirement, and having done so, he has to make the best of it; but let him not be surprised if in a few years he finds himself wondering if he took the right step.

Let us follow the fate of one such middle-ranking officer who retires at maximum age from one of the specialist branches. He has academic and technical qualifications but lacks the glamour and prestige of the aircrew officer. We will call him George.

George likes his R.A.F. work and does not look forward with any pleasure to relinquishing it, in spite of the fact that he is active when off duty, in the pursuit of gardening, golf, walking, reading, music, house maintenance and amateur carpentry. It might be thought that he would welcome the chance of enjoying these activities at his will and without interruption. But not so; a year or so before his retirement he realizes that a life of doing every day just what he chooses to do would prove enervating. He needs some sort of external discipline, so he decides that he must get a job. This would also provide some additional income which, while not essential, would make life more comfortable. So he begins to search the appointments columns

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of the *Telegraph* and *Sunday Times*, and is encouraged to find that there are many jobs which seem to be almost tailor-made for him, i.e., posts in management, requiring technological qualifications and experience. He writes out his applications and is pleasantly surprised at how impressive his case appears when put on paper. How can the potential employer fail to be impressed? But nothing happens; so George puts in more applications and eventually an occasional polite rejection note arrives, or an evasive "Perhaps later on", but nothing more encouraging. George is somewhat deflated and, on reflection, concludes that he cannot expect to break into a new career at something like the same level as he at present occupies in the R.A.F., because of his age. The posts for which he is applying are not for an ageing man. The misguided employer is seeking a younger man and fails to realise that George's qualities and experience far outweigh the virtues of comparative youth. So, reluctantly, George sets his sights lower. But again the expected stream of invitations to interview fail to arrive. Still more abashed, George ponders again and concludes that there are two major factors operating against him now, viz., his age and his rank. The potential employer can hardly envisage a senior R.A.F. Officer stepping down sufficiently to work smoothly under the direction of a younger man, in spite of George's insistence that he is willing to do just that. However, George perseveres and there are occasional glimmers of hope, but nothing positive emerges.

Time is passing and letters, notes, and documents begin arriving from the Ministry of Defence warning George of his impending retirement and telling him what he may do, may not do and must do. It all begins to look somewhat formidable. Among the things he may do is to apply for resettlement training. So George sees the education officer for the first time in his career, and finds that there are a number of possibilities. These include, (a) pre-release secondment to a business or industrial concern for training; (b) pre-release house maintenance courses; and (c) pre-release courses in business management. George is attracted to (a), but is not quite sure what business or trade to go for; (b) would be very helpful should he fail to get a job; (c) would be very useful if he should get the right sort of job and might even help him to get one. So he opts for (c), applies, and is called for interview in due course before a panel of local personages. They seem somewhat impressed by George's rank and treat him with surprising deference, which is most restoring to his self-esteem after the buffeting it has received in the preceding months. He is accepted and eventually goes to London for his six weeks' course.

George's co-students turn out to be four R.A.F. officers, two naval officers, one Royal Marine, four army officers and a couple of colonial civil servants; none of these has he met before, but many of them find they have mutual acquaintances. The course starts in the morning with the usual pleasantries from the principal of the college, but then comes the jolt. Instead of adopting the leisurely approach which George had envisaged as likely on an old gentleman's course on leaving the service, the course tutor weighs right in and subjects the students to a steady torrent of facts, information and exhortation, and leaves them gasping at the end of the day. He makes frequent reference to "writing up your notes", so George goes to his lodgings and flounders about trying to write up the notes which he has scarcely been able to

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get down even in scribbled form, owing to the speed of the instruction. In addition he is harassed by the thought of the formidable reading list which has been issued. Bang goes George's vision of six weeks of semi-holiday in London! Later in the course the tutor admits that the shock tactics at the beginning are deliberate to counteract the very attitude with which George started. The pace does slacken as the course progresses, but steady application is required and bursts of frantic activity are necessary during the syndicate exercises. Just like real business!

During the course, the problem of getting a job is not neglected. Far from it: much advice and instruction is directed to this end. George and his colleagues are told that they should put in some hundred applications during the six weeks they are there; all this in addition to the nightly note-writing and text-book reading! They are also told that during the last three or four weeks they will notice odd members of the course absent from occasional lectures. They will be away attending interviews. But this does not happen; what a dud lot George and his co-students must be! Fortunately for peace of mind, the syllabus seems to include an element of fiction as well as fact!

George comes to the end of the course and returns to his unit for the remaining few weeks before his release leave, feeling competent to manage any commercial concern, but not very hopeful of getting the chance. To publicise his qualification he sports the college "Management" tie, which startingly displays the college crest over symbolic crossed swords and umbrellas in vivid orange on a black background.

A few invitations to attend for interview begin to arrive, each raising George's morale spectacularly from the trough of despondency to which it descends in between. On one occasion he is startled to be accosted with "Well, do you remember me?" This calls for great finesse, to conceal the fact that George does not recognise his potential employer as one of his own junior officers of years ago. And so on, until finally he is able to choose from four or five jobs and settles for one which promises to be interesting; the sort of job appropriate to an officer some two ranks junior to himself. George signs the contract and settles down to work as a civilian. What is it like?

George is realistic; he knows that he cannot expect to carry his service prestige with him into civil life. He appreciates the advice given on his course, that except in certain special positions, it is better to drop his service rank prefix and this is certainly so in his case, for with his company everyone from typist upwards, with the exception of the chief himself, is addressed by Christian name. This leads to some minor embarrassment, although not to George. He, being comparatively elderly, seems almost venerable to some of the younger members of the staff, and the more timid of them cannot bring themselves to commit the lese majesty of addressing him as "George", so they call him "Mr. Jones"; but they are careful not to use his service rank. Of course, there are the very young, very brash ones who shout "George" at him without hesitation, and there are those who use this personal method of address, but with some hesitation. But it all works very amicably, and even now he sometimes gets his "sir"!

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There are numerous other adjustments which George has to make in his thoughts and actions. After many years of directing the activities of others, he finds that he now has to do things for himself, and for other people, and it is surprising how difficult it is for him to get back into the way of actually doing comparatively simple things, which he has for so long taken for granted. He has to forgo his carpeted sanctum for a desk in an office shared by others, and he may even be distracted by fatuous chatter of young people of both sexes. He must learn not to resent directions, however courteously given, from his immediate superior, far, far younger in years and experience than himself. He must remember that Wednesday afternoons are not for golf, tennis or rugger. If he goes sick, he must remember to get the proper certificates and if he wants to consult the doctor, he must be prepared for a long wait in a surgery waiting-room full of all sorts and conditions of men, women and children (unless he is willing to pay for privilege). And so on, and so on.

But George is content. He has lost prestige but not dignity. He is doing useful work well within his competence for very useful remuneration. His brief experience of civil business confirms his belief that in matters of management and efficiency the R.A.F. has nothing to be ashamed of. After a few years, when he is tired or his firm can use him no longer, he can step quietly back into the role of a retired senior officer, writing letters to the press, serving on local committees, indulging in nostalgia, eking out an existence on a steadily depreciating pension, and wondering what it is all in aid of.

READERS CRITICISMS INVITED

We hope the contents of this Journal comes up to the expectations of subscribers.

Our ambition is to please *all* of our readers *all* of the time; perhaps this is too ambitious!

It would be very satisfying if we could meet the approval of *most* of our readers *most* of the time.

The only means of doing this is by subscribers sending the editor their observations, criticisms and suggestions as to the kind of articles that interest them and, of course, those that do not.

Our aim is to produce a journal of a standard high enough to be worthy of our Air Forces, and one that is at least comparable with those of other Services.

It would be greatly appreciated if our readers would co-operate with the maintenance of this aim by writing to the editor in time to include their suggestions in the planning of the contents for issues in 1967.

EDITOR.

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TRIUMPH

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NEW TRADE STRUCTURE

(DEVELOPMENT OF 1964 ENGINEERING TRADE STRUCTURE)

By Group Officer B. G. Martin, o.b.e., w.r.a.f.

Introduction

1. The 1964 Trade Structure made radical alterations to the rank and career patterns in the engineering trades, but made no significant change in their technical scope and function. At the time of the 1964 reorganisation it was realised that future engineering requirements would lead to considerable further modification but the Technical studies were not far enough advanced for inclusion in the 1964 review without unacceptable delay.

2. The further reorganisation of Trade Groups 1—4 is being announced in July, 1966, in a series of DCI's and it is important for everybody concerned with aircraft and electronic engineering and with the management of airmen in the engineering trades to understand the principles underlying the changes. This is a radical re-appraisal of the requirement for, and the utilization of technical skill and also of the type and scope of technical training needed in the future. In 1962 a report by the Technical Skills Requirements Working Party made three main recommendations which have been embodied in subsequent studies:—

a. Each trade should constitute a field of employment within which the span of initial training could be exploited.

b. An apprentice of superior ability was needed who could be trained over relatively wide spans of technology related to the long term trends of system engineering, and who would be the diagnostician and serving co-ordinator of the future.

c. Trades should be regrouped into broader fields and initial training should concentrate on basic techniques, leaving training on the application of this basic knowledge to equipment to post graduate instruction.

The Main Features of the Reorganisation

3. The Ground Trades at present covered by the four aircraft engineering trade groups will be reorganised into two trade groups, the first covering aircraft engineering and including weapons, aircraft electrical components and general instruments. The second trade group divided into Air and Ground Sub Groups will include all electronic and navigational instrument servicing.

4. In the two groups there will be three Technician, nine Fitter and ten Mechanic trades each covering a different field of employment described by their trade titles.

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For instance the air sub group of the new Trade Group 2 will include the trade of Electronic Fitter (Air Radar). Airmen in this trade will be initially trained in the broad principles of air radar to a depth which will enable them, after post graduate training, to apply these principles to any air radar equipment. The employment capability (i.e. the equipments on which an airman has been trained) will be recognised by "Q" annotations. Airmen can, in the course of their careers, be trained to service an ever increasing range of equipment and their skill and knowledge can be fully utilised without the need to remuster from one trade to another.

5. With this new concept of fitter training we can, in time, eliminate the narrow trade boundaries (for instance of the Air Radar Fitter (Fighter) (Bomber) and so on) and achieve a greatly increased flexibility of employment. The resultant benefits will not be all on the side of technical efficiency. Airmen will belong to a larger trade offering more varied employment, and the greater flexibility will ease such administrative problems as home overseas ratios.

The Craft Apprentice Scheme

6. The new craft apprentice scheme started in 1964. The training places more emphasis on practical servicing than pure theory, and actual equipments are used only to illustrate application of principles and to prepare for the first posting. If subsequent postings require knowledge of different equipments then post graduate training will be given. By this means it has been possible to shorten the length of apprentice training. The first craft apprentices will start productive service this summer.

The Technician Trades

7. The requirement for a diagnostician, servicing co-ordinator and systems specialist will be met by three new technician trades: Aircraft Technician, covering the span of the four fitter trades in the new Trade Group 1 (airframe, propulsion, weapons and electrical components and general instruments), and in the new Trade Group 2 Electronic Technician (Air) covering air radar and air communications, and Electronic Technician (Ground) covering ground radar and ground communications and telegraphy. Technician apprentices are now under training to these trades and the first of them will graduate in the Summer of 1967. The qualification for entry is 4 acceptable GCE "O" levels and the standard of this 3 year course is set at ONC level.

8. Apprentice training will fit technicians to understand the workings of large installations employing a wide variety of engineering techniques, and they will be responsible for obtaining optimum performances out of complex systems. They will be comparatively few in number and their work will be the diagnosing of faults and co-ordinating the work of fitters from perhaps 3 or 4 different trades in rectification and other engineering tasks. The technicians will not supersede the conventional fitter although they may in time take over some of the tasks now carried out by systems fitters.

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9. After completion of training the technician apprentices will pass out as corporals and will have about 2 years improver service. This will consist of formal courses on systems as well as practical training on units. The technician apprentices will reach Sergeant rank at about the age of 25, and will be very young for so much responsibility. They may find difficulty at first in handling older and more senior men whose engineering experience is considerable albeit in a narrower field. The Royal Navy have successfully operated their artificer trades with a similar age and rank structure for a number of years.

10. Earlier in 1967 we will receive the first Senior NCO's into these trades from amongst fitters who are qualified and selected for re-mustering. Those eligible will be the dual or multi skilled airmen and those having an ONC, the appropriate City and Guilds Certificates, or certain Q or QS annotations. There will be a special examination and a selection board held at the Record and Pay Office. The board will look for the NCO who is not only an outstanding tradesman, but who can work closely with technical officers, industrial engineers, aircrew personnel and fitter tradesmen. These NCO's must have a good command of verbal and written English and be able to discuss complex technical matters with people, both senior and junior to themselves, service and civilian. The standard will be very high and those selected will either be posted to technician vacancies by about May, 1967, or be put on a waiting list and called forward when further vacancies occur.

11. This is the broad picture of what can be best described as a logical evolution of the 1964 trade structure to meet future engineering requirements. Trade boundaries have been expanded, equipment training has been tailored to meet the true Service requirement, and the need for the very broadly trained man has been met. The re-organisation will make more flexible and efficient use of the high skills of airmen, and as requirements fluctuate between these skills due to the introduction of new, and/or phasing out of old equipment, the surpluses and deficiencies caused can be balanced without the need for lengthy conversion courses, re-mustering action, or complicated cross-manning.

The Effect of the Scheme on Serving Airmen

12. An article such as this would be incomplete without mention of the arrangements made to assimilate serving airmen, and it was the complexity of these arrangements which held up the introduction of the re-organisation. What follows is written in very general terms and does not attempt to cover all the assimilation provisions.

13. The airmen who already have more than one skill, such as the aircraft servicing chief, or the radio fitters, will be eligible to apply to remuster to the new technician trades, to stay in their own interim trades, or to remuster to a new fitter trade. Most of the single skill fitters can be assimilated to the new trades but some will need a Q annotation to identify their servicing capabilities. For instance an Air Radar Fitter (Fighter) will be Q annotated to show that his present experience is on fighter aircraft. This will not limit careers as promotion will be in the

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basic trades, regardless of annotations. Promotion examinations will be set on trade principles and will be within the compass of all airmen in the trades. In some cases conversion training will be necessary, for instance to the new trade of Aircraft Fitter (Electrical) which combines the trade of Electrical Fitter (Air) and Instrument Fitter (General). These latter trades are retained as interim trades with full promotion prospects.

14. The establisments will be written in the new trades and where a specific servicing skill is needed it will be annotated with a Q. If an airman with that Q is not available then someone will be selected for training to fill the post. Other considerations influence selection for posting, i.e. the fair operation of the home/overseas rosters and the need to put a time limit on continued employment on one specialized aspect of a trade.

Conclusion

15. The new technician trades will have at the outset a number of experienced NCO's who will be able to help the Royal Air Force to make the best use of this new type of tradesmen, and to guide the young technicians through their first years of improver and productive service.

16. Some members of the Service may criticise this radical re-organisation of the engineering trades as coming too soon after the 1964 trade structure. The effect of the changes in the structure on the individual airman will be gradual and the benefits of wider opportunities will be cumulative. The main impact of the greater technical flexibility and the more economic use of skill and training facilities will be felt in the 1970's, at the time when the advent of new aircraft and equipments will tax the engineering efficiency of the Service severely. This re-organisation has been aimed at the future, and its introduction now will enable the greatest benefits to accrue just when they are most needed.

DELIVERY OF ARTICLES TO EDITOR

The *final dates* upon which articles must reach the Editor for inclusion in the Spring, Summer, Autumn and Winter numbers are: —

SPRING (MARCH)	22nd DECEMBER
SUMMER (JUNE)	25th MARCH
AUTUMN (SEPTEMBER)	24th JUNE
WINTER (DECEMBER)	23rd SEPTEMBER

It is sincerely hoped that contributors will not wait until the very last day before dispatching their articles to the Editor, as this can seriously disorganize the works schedule for getting the " Quarterly " to press and could delay its date of issue.

The early delivery of copy would be greatly appreciated.

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (ret.)

SINGULARLY little has been said in Parliament during the last few weeks concerning the professional side of the Royal Air Force and the Air Forces of the Commonwealth; so we have an opportunity, here and now, to consider the overseas policy of Her Majesty's Government, which, after all, is a fundamental interest of all the Services, since it is they who have the responsibility for supporting that policy by their presence and, on occasion, by the application of force.

EAST OF SUEZ

It would appear that the times when we "held the gorgeous East in fee" have come to an end. In fact they ended soon after the Second World War, if not before. Much sentimental and patriotic nostalgia for times past is still expressed—I think excusably—by those who knew the Victorian and Edwardian Ages; and, provided no attempt is made to apply that nostalgia to the policies of today, it does little or no harm. Perhaps the present writer, who was also a Victorian and an Edwardian and who once, at the tender age of six, received a special bow from Queen Victoria all to himself, on the Windsor to Datchet road one summer afternoon in 1898, may be permitted a bit of private nostalgia. For the *Pax Britannica* was a very real thing. The British Navy and Army may be said to have kept the world in order for nearly a hundred years, from 1815 to 1914; and, with the assistance of the Royal Air Force and of the Americans, from 1918 to 1939.

There is no doubt that, during those periods, prosperity increased among the civilized, semi-civilized and uncivilized inhabitants of all those parts of the world to which European influence extended. Whether they are better off in present circumstances than they would have been, if we and the other advanced European nations, with the United States, had continued to exercise over them our beneficent control, is beside the point. We have largely ceased to do this, and through no fault of our own—or, for that matter, of anyone else. This change was inevitable for two reasons: the financial burden on the British tax-payer, much crippled by the cost of two world wars, has become too heavy; and the numerous emergent African and Asian states have rightly demanded—and have generally been graciously granted—their freedom. To attempt, even to consider, regaining or holding on to our overseas Empire, except on the basis of free and equal partnership in the Commonwealth, would now be absurd; so our policy must be to shed our responsibilities one by one with a good

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grace—as indeed we have done so far—and to ensure that, when we do so, the peoples over whom we have for so long exercised a paternal care shall be capable of self-government and shall suffer as little social and economic hardship as possible during the period of transition.

That then is the background to the exchanges which took place at Question Time in the House of Commons on 23rd June this year, when the Prime Minister was questioned by various hon. members on the subject of our defence commitments in South-East Asia.* In reply, Mr. Harold Wilson said that the responsibilities we carry in that part of the world are by no means limited to the defence of Australia; and that the Foreign Secretary, Mr. Michael Stewart, would be having talks with the Australian Government during the next few days, when they would have an opportunity of discussing our Far Eastern defence policies at length and in detail. The Prime Minister made it clear that the British Government had no intention of evading their responsibilities to the Australian Government, or to the government of any other Commonwealth state, in that or in any other part of the world; but the nature and extent of those obligations were matters for discussion between the governments concerned. He also said, quite categorically, that Her Majesty's Government were "not involved in supplying arms to Vietnam."

Our obligations, as an independent nation and as a member of the Commonwealth, of the United Nations and of S.E.A.T.O., include the defence of all Commonwealth territories in South-East Asia and helping to keep the peace in that area for the benefit of all. Although the United Kingdom is not a signatory of the A.N.Z.U.S. Pact, our obligations include the rendering of assistance in the defence of Australia if called upon to do so. Recently we have had to send large numbers of troops to the Malaysian territories in Borneo (Sabah and Sarawak), owing to the so-called "confrontation" which President Sukarno of Indonesia saw fit to set up there. Happily the President now appears to have thought better of it—whether of his own free will or under the influence of *force majeure* it would be unkind and unnecessary to speculate; and so we shall soon be in a position to withdraw the greater part of our troops now in Malaysia for service in, or nearer to, the United Kingdom, besides saving much of the cost of their maintenance in the Far East.

This also was the subject of questions to the Prime Minister. His replies were wisely and necessarily guarded. We should not, he assured the House, begin to withdraw troops until we were quite certain that "confrontation" was ended, and that there was no longer need for their presence. He could not say just yet how many troops would be withdrawn, but he had good reason to expect that the withdrawal would be "massive". That was as far as he would go on that occasion and it was as far as he could be expected to go in the circumstances. He agreed with another questioner that our defence commitments East of Suez constituted a very heavy burden for the British tax-payer and he was determined to ease that burden as much as possible, partly by the reduction of unnecessary or undesirable commitments and partly by ensuring that our necessary commitments were discharged as economically

* Hansard, H. of C., 23 June, 1966, *Oral Answers*, cols. 906 - 12

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as possible. The Defence White Paper of February this year had contained the Government's proposals for reducing the cost of overseas commitments; but he repeated that British and Commonwealth interests would not be sacrificed for the sake of financial economies. One way in which economies could be effected was by relying more on mobility and less on permanent or semi-permanent garrisons in overseas territories.

Closely connected with our defence commitments in South-East Asia was the question of the Singapore base. So long as the Government of Singapore, which is of course now independent of Malaysia again but still a member of the Commonwealth, is agreeable to our maintaining a base in Singapore on satisfactory terms, it is likely that we shall continue to avail ourselves of that facility; but no doubt the Foreign Secretary will be discussing an alternative site with the Australian Government during his present visit to Canberra. Sydney is, of course, the obvious choice—and it is a pity it was not selected instead of Singapore in the first place—but there are other possible sites.

Another question which calls for careful consideration in our Far East policy is the extent to which we should apply our resources in opposing communism. The main reason and justification for the massive support which United States forces are now giving to South Vietnam seem to be to prevent the further spread of communism in South-East Asia. Neither the American nor the British Government can have any valid objection to Russia or China being communist—or, for that matter, any other independent country which freely chooses communism instead of democracy as its form of government. But what we and the Americans object to, and what we might, like the Americans, oppose by force of arms if need be, is an attempt by either of the two big communist states to impose communism on any small and unwilling nation. We are exponents of the doctrine of self-determination, and we don't want to see communism spread in South-East Asia or anywhere else against the wishes of the people concerned. This is not McCarthyism, though Mr. Harold Wilson has recently been accused of that in another connection, namely his accusation (no doubt well-founded) of communist influence over the seamen's trade union.

ADEN

At the time of writing it is being announced that Service families are to be brought home from Aden next year. This is none too soon. Life in Aden is unpleasant enough without the daily "incidents" which have been occurring recently, and it is now no place for British women and children. Presumably this evacuation will be done partly by normal home postings on completion of the usual two-years tour of duty and partly by the special return of some families to the United Kingdom in advance of their menfolk. It would simplify the process of reduction and the ultimate evacuation if no more families were sent out from now on.

This raises the question of Aden's future, which is a difficult question and a sore point with many politicians. The first point seems to be that we no longer need a base at Aden. Its functions can be fulfilled by bases elsewhere in more friendly

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territory. The second point is that we are no longer welcome there. It is impossible to maintain a military base satisfactorily among hostile people, and there is now sufficient hostility in Aden to render the base there unsatisfactory from a military point of view. How far President Nasser is responsible for this attitude — and it seems that he is the principal inspirer and supporter of anti-British feeling among Adenis — is really beside the point. It is enough to know that we are not wanted there and that we do not need to stay there. We have agreed to grant the South Arabian Federation, including Aden, their freedom in 1968 and that will be done.

But what about our promises to the emirs and sheikhs of the numerous little states which, with Aden itself, now constitute the federation? The terms of these promises are not at all clear. It is now generally accepted that the base will not be tenable much longer; and the fact that much of Aden's revenue comes from the base means that she will lose that much on our withdrawal. This is just too bad, but it cannot be helped; and no doubt the prosperous merchants of Aden, and the coolies, will find some alternative sources of profits and wages—or put up with a lower standard of living. If we have promised to enter into treaty relations with the states of the federation — or with the federation itself, if it continues to exist after our withdrawal (which seems unlikely)—then we shall no doubt do so; but the terms of such treaties have yet to be determined, and that leaves almost infinite room for negotiation. One thing, however, seems certain. We cannot promise to bolster up a lot of anachronistic feudal emirates and sheikhdoms against the declared wishes of the people of those states. We must move with the times; and so must the sheikhs and emirs, or accept honourable retirement like the Indian princes after 1947. There is no place in the modern world for petty tyrants and self-seeking autocrats, not even among the recently backward peoples of Arabia. Mr. Harold Macmillan's "wind of change" is blowing with ever increasing velocity all over the world; and self-determination and democracy are the solvents which will remove the old regimes and substitute new ones. Those who are wise will bow to the inevitable and conform with the new ideas, as so many have already done in Arabia as elsewhere. And those who resist will be broken. It is as simple as that.

So we shall no doubt enter into treaty relations with the emergent states of South Arabia, for the sake of peace and prosperity and for our mutual benefit; but they will not be the same states as those which now exist—at least, not constitutionally the same. If, during the next few years, some of the rulers of those states are replaced by others of a more constitutional kind; and if some succeed in reforming themselves; so much the better. South Arabia, like Saudi-Arabia and Kuwait, will get a new look, and all will be well.

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R.A.A.F. in Vietnam

By Squadron Leader W. Smither, D.F.C. (Retd.)

For nearly two years a flight of Royal Australian Air Force Caribou transport aircraft has operated in support of the military effort in South Vietnam. In June this year the R.A.A.F. contribution was increased to include a squadron of Iroquois helicopters. This article describes the work of the Caribou flight and some of the hazards they have been facing.

VUNG TAU: As the R.A.A.F. Caribou flew over the Delta airstrip, a Vietnamese soldier fired a smoke flare which showed the wind exactly at right-angles to the strip. The two R.A.A.F. pilots looked at each other as if to say, "Wouldn't you know it — it's all we need, a short strip, maximum load on board, and now a cross-wind." Then the Caribou started its sharp spiral descent almost directly above the runway, a technique adopted by the R.A.A.F. to minimise the danger from enemy ground fire from outside the airfield boundaries.

Touching down almost on the very end of the runway, the Caribou raced along the noisy P.S.P. metal strip until it seemed it would run right off the end. Seconds later, the aircraft was braked violently to a stop by the action of the reversible pitch propellers and brakes, and it stopped a few feet short of the far end of the strip.

All hands help

Eager hands, military and civilian, helped to unload the dozens of bags of rice which formed the main cargo. The airstrip was at Hai Yen, a small settlement 185 miles south-west of Saigon, whose only means of support was by air. Viet Cong troops had cut all roads leading to the settlement.

It was another routine landing for the R.A.A.F. men, who fly Caribou aircraft every day in all parts of South Vietnam. They are members of the R.A.A.F. Transport Flight stationed at Vung Tau, 50 miles south-east of Saigon.

The aircraft deliver tons of food, ammunition, men and equipment to airstrips ranging from heavily defended air bases, to dirt strips barely long enough to take the aircraft. Some are safe from the Viet Cong only during daylight hours. To keep the aircraft serviceable, R.A.A.F. ground crews are working 24 hours a day at Vung Tau, under much less than ideal conditions.

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An R.A.A.F. Caribou crew returns to Vung Tau after a ten-hour day, which took them to nine different landing zones in the Mekong delta area. They carry their personal arms, and the man on the right is still wearing his "flak vest", which protects the wearer from small arms fire.

The U.S. Army also flies Caribou transports from this base, and the R.A.A.F. is associated with them for spares and other equipment.

Two items of equipment used by the R.A.A.F. flight which are the envy of the U.S. Army men working on their Caribou at the same base, were taken to Vietnam by Hercules at the onset of the R.A.A.F. move.

One of them, a "cherry-picker" hydraulic platform, enables work to be carried out on the highest part of the tall tailplane of the aircraft. This item is often borrowed by the U.S. Army men. The other equipment causing interest is a group of specially designed Australian-made floodlights, operating from their own power plants, which enable the men to work after dark on the aircraft, even if parked well away from the hangars.

Pickings from " graveyard "

Displaying the well-known Aussie ingenuity, the men are making good use of a "graveyard" of damaged aircraft near where they work. Many spares for the Caribou, and other pieces of useful equipment come from the dump, and are put to good use by the R.A.A.F. men.

For operational control however, the R.A.A.F. men come under the U.S. Air Force at Saigon, who allot the R.A.A.F. crews daily tasks. At least four Caribou fly each day, carrying tons of mixed cargoes to several points in the operational areas. Almost every day, while on their way to Saigon to pick up the first of the day's freight, the R.A.A.F. Caribou drop several sticks of Vietnamese paratroopers into a practise landing zone near the base. The Caribou picks up the first of its loads from

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Saigon and sets out for the long haul around the air bases, either north of Saigon, up to near the border of North Vietnam, or south down to the tip of the Mekong delta.

During a typical day, the crews may land at as many as 10 strips, particularly in the delta. The cargo handled could range from food and arms, to soldiers, civilians and livestock. Some of the aircraft have been hit by ground fire, despite the flying technique, but none has been seriously damaged. Aircrews wear flak vests to protect them from light ground fire, and their seats are protected with a new kind of armour plate.

One of the heaviest tasks in the flight has fallen upon the loadmasters, who are responsible for the safe handling and carriage of the freight. The Caribou, in the hands of the R.A.A.F. crews, is living up to its reputation as a formidable medium transport aircraft, capable of operating from short unmade strips, with fast loading and unloading facilities.

The Battalion Commander of the U.S. Army base at Vung Tau, says, in talking of of the Australians, that far from being a token force in Vietnam, as some people might imagine, the R.A.A.F. flight was filling a real need for more transport aircraft and men to maintain them, in a war where every man and piece of equipment counts.

Proud claims

One of the proudest claims the R.A.A.F. men in Vietnam can make is that they have recovered two badly-damaged Caribou from small airfields in the country, both under difficult and dangerous conditions.

The first aircraft had its nosewheel assembly collapsed when it taxied along a dirt strip after heavy monsoonal rains. Mud had filled a hole at the side of the runway, and the nose wheel sank deep into it. The strip. like so many in the area, was not secure from the Viet Cong after dark and the crew had to be flown back to base by U.S.A.F. helicopter before nightfall. Next morning, flown back into the area, the R.A.A.F. men carried out temporary repairs to the nose wheel and the aircraft was flown back to safety the same day. The journey back to Vung Tau was made just before dark, with all wheels down, at reduced speed.

In the other recovery, R.A.A.F. men made major repairs to a damaged Caribou at Hai Yen, south of Saigon. The airstrip is outside the fortified settlement which protects the people of the village, at that time being harassed by Viet Cong. The work party of R.A.A.F. and a few U.S.A.F. men had to confine their activities to daylight hours, and at night retreat into the defended village for protection. During the four days and nights it took them to repair the aircraft the settlement was attacked by Viet Cong forces, and for all the men but one, it was their first time under fire.

In repairing the Caribou the men had to manhandle the aircraft in deep mud where it had slewed off the runway, and change a mainplane and engine using only the most primitive of equipment. Replacement parts were flown in by helicopter, and the men replaced these and made repairs to the electrical system and instruments just sufficient to enable the aircraft to limp home at reduced speed on the fifth day.

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YEARS OF COMMAND

SHOLTO DOUGLAS

A great RAF commander's account of his war years; the sequel to his highly praised *Years of Combat*

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Book Reviews

SHOLTO DOUGLAS, VOLUME II. "YEARS OF COMMAND", by Marshal of the Royal Air Force Lord Douglas of Kirtleside — with Robert Wright (Collins, London; 382 pp.; 22 illustrations; 50s. net).

A personal story of the Second World War

Volume I of the Autobiography of Sholto Douglas—Marshal of the Royal Air Force Lord Douglas of Kirtleside, G.C.B., M.C., D.F.C., entitled "YEARS OF COMBAT", reviewed in Volume 3 No. 4 (Winter number) 1963 of *The Royal Air Forces Quarterly*, covered the period of the First World War and his brief period of unemployment, early pioneer work with Civil Aviation and his return to the Royal Air Force on 25th March, 1920, with a regular commission as a Squadron Leader. Some of those *now serving* were mere children when these events of 40 to 50 years ago took place, most of them were not even born and possibly the contents of Vol. I were of more interest to their fathers and grandfathers.

Volume II entitled "YEARS OF COMMAND" has now been published, covering his meteoric promotion, in the comparative space of 26 years, from Squadron Leader to the highest rank in the Royal Air Force in 1946. These events of 20 to 27 years ago, being within the personal knowledge of a far greater number of those now serving, will naturally be of equal interest to them as to their elders who will find this book holds their attention from the first page to the last.

In addition to Sholto Douglas's Royal Air Force career up to 1947, there follows the momentous events during his appointment as Commander-in-Chief and Military Governor of the British Zone, Germany, which includes his part in the famous Nuremberg Trials; his elevation to the Peerage in 1948; his appointment as Chairman to the Board of B.O.A.C. and Chairman of B.E.A. in 1949, which he held for 15 years.

The title of this book is well chosen in that Sholto Douglas served as Commander-in-Chief without a break from the Battle of Britain to the end of the Second Word War. It is a unique record and Volume II deals with weightier and broader aspects of our times than those related to the first Volume "Years of Combat".

It is difficult to assess at which part in his career he bore the heaviest of his great responsibilities; reading between the lines it would seem that those that bore most heavily upon him were those when he had to deal with the appeals of the war criminals after the Nuremberg Trials.

Many histories have been published of the preparations for the Second World War and the Royal Air Force's in particular and the part Air Power played in it from 1939 to 1945, but who could be better equipped to portray all the details than Sholto Douglas who was so personally concerned through the nature of the many responsible appointments he held throughout this period.

His great personal experience as a fighter pilot in the First World War and his period as Commander-in-Chief of Fighter Command during the Battle of Britain might lead some readers to believe that he is slightly biassed when dealing with the roles of Fighter Command and Bomber Command.

The writing of one's own biography must present many difficulties, not least the temptation to water-down outstanding and personal capabilities, from natural modesty; Lord Douglas's story is in no way spoilt by this weakness as he tells it with the authority, humanity and directness for which he is well known. This is an autobiography of vast interest which should be read by all past and present members of the Royal Air Force. A.H.S.

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The Invention of the Aeroplane 1799 - 1909, by Charles H. Gibbs-Smith (Faber & Faber, London; 360 pp.; illustrated; 84s.).

This large, impressive and invaluable book represents the end product of years of research by its author. Many people write histories of aviation, for it is not difficult for any competent journalist to collect together facts, figures and photographs and offer them to the public as a superficial survey of the better-known highlights of the story of flight. Charles Gibbs-Smith is one of the few genuine aviation historians, whose books contain original thought and deduction and are therefore satisfying to even the most knowledgable of their readers.

But for his patient unearthing and sorting out of facts in recent years, Sir George Cayley might not be acknowledged as the first to build a man-carrying aircraft; Stringfellow might still be be credited with rather greater achievements than he deserves; and the successes of Du Temple in about 1874 and Phillips in 1907 might not have been put in their true perspective.

There is the other side of the penny. Mr. Gibbs-Smith's tremendous admiration of the Wright brothers sometimes tends to make him treat other pioneers like Curtiss and Roe with less than justice. But historians are human and, in any case, their books would be deadly dull if one were not able to sort out the heroes and heroines from the authors' pet villains of the piece.

The basic purpose of this present book is to examine in detail the birth and coming of age of the aeroplane in the single decade of 1899 - 1909. The preceding century is covered in only 30 pages; but this is adequate to trace the really important early steps that led to the Wright brothers' triumph in December, 1903.

Cayley is shown clearly as the man who started the process that led to practical aviation. Indeed, Mr. Gibbs-Smith considers the period from 1799 to 1809 as being one of the two vital decades in the history of the aeroplane. In his own words:

"It was in 1799 that Sir George Cayley invented the modern aeroplane configuration of fixed wings, fuselage, tail-unit of elevator and rudder, and independent propulsion-system: by 1809 he had built and flown both model and full-size machines incorporating his discoveries, and had completed his epoch-making paper 'On Aerial Navigation' (published 1809 - 10); it was this publication which laid the foundations of modern aerodynamics and practical flight control. It was to take a century of invention and endeavour—much of it wasted in futile projects—for aerodynamics, petrol-engine technology, and pilotage, to join together and produce the successful 'hardware' in the shape of the practical powered aeroplane."

So, at the end of the century, we come to the second great decade that forms the subject of the book, starting with the Wright brothers' warping kite of 1899, and ending with the first great aviation meeting at Reims in August of 1909.

An amazing thing about this book is the effort that has been made to put everything in historical perspective. For example, when Mr. Gibbs-Smith records that Percy Pilcher was the first aviator to be killed in Britain, he notes that the same year also saw the first fatal accident to an automobile driver in Britain. This sort of information may not be vital to an aviation history, but it adds to its value so far as the professional reader, writer or lecturer are concerned. There is even a page of conversion tables in the appendices, followed by a page of notes that enable the reader to learn that the Wright brothers' first flight covered a distance nearly as great as the length of two cricket pitches, and that the fourth flight exceeded the length of Westminster bridge by 42 ft.

So far as the main narrative is concerned, it not only traces the history of the aeroplane but describes in detail each of the important aircraft that contributed to the history. It records the complete results of the Reims competitions in 1909; and the appendices cover literally everything from a study of control systems in use in that year to notes on the first aerodrome.

By now it should be clear that *The Invention of the Aeroplane* covers much more ground than the title implies. To say that nobody with a real interest in aviation can afford to be without it is an understatement.

J.W.R.T.

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Diary of the Sinai Campaign, by General Moshe Dayan (Weidenfeld and Nicolson, London; 236 pp.; illustrated; 42s.).

Whatever we may feel about the Anglo-French Suez Campaign of 1956, and however we may view the political intrigues associated with it, there is no disputing that the almost-simultaneous Sinai Campaign fought by Israel improved that country's situation enormously. As a result of its resounding defeat of the Egyptian forces, Israel secured freedom of passage for its ships in the Gulf of Aqaba, an end to the murderous infiltrations that brought insecurity and tragedy to people on both sides of Israel's borders for many years, and neutralisation of the threat of an attack on Israel by a joint Egyptian-Syrian-Jordanian military command.

This diary-type record of the Sinai Campaign is written by the man who was nominally Chief of the General Staff of the Israel armed services at the time. One uses the word "nominally" a little facetiously. The reason is that General Dayan's book seems to show that nobody could really command the kind of army that Israel had at that time.

It was a hastily-assembled army. To prevent any possibility of the Egyptians' guessing what was about to hit them, mobilisation of reserves for the attack was delayed until the last possible moment. The fact that about ninety per cent of those called up put in an appearance seems to have staggered the commanders! Inevitably, however, the resulting ground forces were a mixed bag. On the one hand, there were units like the 7th Armoured Brigade which was so enthusiastic that it steamed into action against orders and could thereby have prejudiced the success of the entire strategy. At the other extreme there were the infantry brigade and armoured brigade whose officers "had a thousand and one good and understandable reasons why they were unable that night to storm the Egyptian positions, with their minefields and well-laid defences", although they had been brought up for the sole purpose of doing so. Their attacks failed. In General Dayan's words: "That they failed is certain. Less certain is whether the actions can be called attacks."

Seldom can any successful campaign have survived more mistakes. The General has been criticised for writing about them; but they were part of the story and he probably hopes that the Israel of today will learn from the mistakes of the past.

In any case, the Egyptian forces emerge with even less to their credit. We heard at the time of the destroyer which lobbed shells on Haifa and then surrendered (although the true story is less damning than the contemporary propaganda version). Now we can read of the commander at Sharm e-Sheikh who "the moment the battle was over, appeared all ready for captivity—together with half a dozen suitcases, well and properly packed." And of the Egyptian troops at Kuntilla who "when they saw our column moving towards them, immediately despatched a report and themselves to the rear."

Despite all this, the Sinai Campaign was no more humane or humorous than any war. The spirit in which it was fought by the more dedicated Israeli troops is summed up in the sentence "As to the comparatively high number of enemy dead and small number of prisoners in the battles along the Kuntilla-Mitla axis, this is due to the way in which our paratroopers fight and not to tough resistance put up by the Egyptians holding this line."

The Israeli Air Force gains nothing but praise from General Dayan. In one place he states: "Though we cannot know what percentage of the damage inflicted on the enemy is attributable to our Air Force, there can be no doubt that in these few days it has had a decisive impact on the campaign. It is, no exaggeration to say that our aircraft have accounted for at least half of the enemy casualties in men and equipment . . . . Only our Air Force has engaged Egyptian tank units in the first days of the fighting—and has done so with much success." On another occasion, Israeli Mustang pilots, having failed to tear down enemy telephone wires with trailing hooks, flew in at a height of 12 feet and cut them down with their propellers and wingtips.

This book, then, is a strange mixture of professional soldiering and guerrilla tactics, bravery and half-heartedness, against a background of sordid politics by everyone involved. If it has any lesson to teach it is that we should be thankful that nuclear deterrents have made old-fashioned wars on a major scale almost impossible. These local campaigns are quite bad enough.

J.W.R.T.

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Airman's Song Book

Twenty years ago Squadron Leader C. H. Ward-Jackson collected and edited an 'Anthology of Squadron, Concert Party, Training and Camp Songs and Song Parodies, written by and for Officers, Airmen, Airwomen mainly of the Royal Air Force, its Auxiliaries and its Predecessors, the Royal Flying Corps and the Royal Naval Air Service': short title, AIRMAN'S SONG BOOK.

The old edition ended with 1945. BLACKWOOD'S propose to issue a new edition next year, and would like to know of (a) Any good songs of the 1912 - 1945 period not already in the book; (b) 1945 - 1966 songs, for a new section. Please write to: *C. H. Ward-Jackson, c/o Blackwood's, 6 Buckingham Street, London, WC2.* One good song deserves another.

Prisoner on the Kwai

We have just published this book (25s. net), and it is going well. Its author, BASIL PEACOCK, always loved soldiering. He enlisted (under age) in the First War, collected an M.C. in the trenches and was wounded and captured by the Germans. Between the wars he qualified and practised as a dental surgeon, but that didn't keep him away from the Army. He became an ardent Territorial. When the Japs struck Singapore, he was out there commanding a battery of the Royal Artillery. Again he was wounded and 'swept into the bag'. Then, with his brother officers and men, he was put to work on the Kwai railway.

What was it *really* like? How did they get medical supplies and food, and hold the Japs in check, and keep up a high morale? What adventures did they have? This is the true story. That is why the public is reading it now. The R.A.F. flew out the prisoners when Japan gave in. One of the navigators was Peacock's son.

WILLIAM BLACKWOOD

Publishers of Blackwood's Magazine

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The First Battle of Britain—1917 - 18, by Major Raymond H. Fredette, U.S.A.F. (Cassell, London; 289 pp.; 62 illustrations; 8 maps; 36s. net).

After painstaking research through earlier books, documents and other correspondence on the first German air raids and military and political bickerings of that period, the author has produced after a lapse of fifty years the first book of its kind; in which there is much of interest.

He reminds us that the Germans were the first to use air power for the bombing of undefended towns and cities, with a view to breaking the enemy's will to resist; a strategy strongly advocated by the Italian General Douhet in his book several years later. *At that time* the short-range of British aircraft restricted them to the tactical bombing of the enemy's aerodromes and lines of communication. Even the restriction to the bombing of military targets at times caused the deaths of civilians, as in the case of the bombing of Cologne railway station, when large numbers of children were killed on a nearby lake. Which is the more effective of these two strategies has been a matter for debate ever since.

Much of Major Fredette's interpretation of these events of fifty years ago is open to criticism as will be his mistaken facts. Throughout there is a cynical bias in places regarding the Royal Air Force and he does less than justice to Lord Trenchard "The architect and founder" of a Service which today is second to none; even misguidedly denying him the right to this title which he so rightly earned. His suggestion on page 156, that General Trenchard thought then that the aeroplane had *no military use other than in a tactical sense* is equally misguiding. The reviewer, who served on his staff in 1917/18, has never doubted the General's firm belief in strategical bombing at that time. He would have made strategical attacks on military targets, *if he had* been given suitable aircraft in adequate numbers to make this effective. Fortunately Marshal of the Royal Air Force Sir John Slessor makes General Trenchard's position at that time abundantly clear in his excellent chapter "AN AFTERWORD" at the end of this book. There are smaller errors, such as describing the *first* uniform of the R.A.F. as "Pale blue with stripes of gold lace, with an elaborate cap device with a spray of gold leaves". The first uniform was khaki with blue mohair bands of rank; as in the Navy and Army "gold leaves" were only worn by field officers; the cap device was no more elaborate than those of the other Services.

Apart from these criticisms, this is a most interesting book adding much to hitherto published histories of that period which will be new to serving members of the Royal Air Force and it will arouse nostalgic memories in those of three score years and ten when reading about *their war* of fifty years ago. **A.H.S.**

Van Farman tot Neptune, by Hugo Hooftman (La Rivière & Voorhoeve, Zwolle, Netherlands; 182 pp.; fully illustrated; 10.75 Dutch guilders).

Some months ago, we reviewed in *The Royal Air Forces Quarterly* Hugo Hooftman's two-volume history of the Royal Netherlands Air Force, entitled *Van Brik tot Starfighter.* Now, from the same distinguished author, we have a companion volume on the Royal Netherlands Naval Air Service.

As before, the text is in the Dutch language, but this will certainly not deter any aviation enthusiast, historian or photo collector from buying the book. It is worth buying for the 450 pictures alone. Few of them will be familiar to British readers; many are, in fact, published for the first time, including a number of pictures of British designs in unfamiliar insignia.

Even the data can be sorted out fairly easily with a little intelligent deduction and a book of conversion tables. Words like "Motortype", "spanwijdte" and "lengte" are obvious, and it requires no great psychic powers to decide that "Leeggewicht" and "vlieggewicht" translate as "empty weight" and "flying weight" respectively.

The standard of production and printing is excellent, making *Van Farman tot Neptune* an attractive as well as valuable addition to any bookshelf. This present volume is devoted to seaplanes, flying-boats and land-based aircraft. A second volume will, in due course, complete the story with the history of Dutch carrier-borne aviation. **J.W.R.T.**

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THE ROYAL AIR FORCE BENEVOLENT FUND was founded in October, 1919, by the late Viscount Trenchard to secure lasting benefits for the personnel of the Flying Services and their dependants in commemoration of their achievements during the Great War 1914-18.

A Memorial to the Officers and Men who lost their lives stands on Victoria Embankment overlooking the Thames, and was unveiled by H.R.H. The Prince of Wales in July, 1923. An inscription, in remembrance of those men and women of the Air Forces of every part of the British Commonwealth and Empire who gave their lives in the 1939-45 war, was unveiled by Marshal of the Royal Air Force Viscount Trenchard at a ceremony on 15th September, 1946.

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Great Mysteries of the Air, by Ralph Barker (Chatto & Windus, London; 211 pp.; illustrated; 25s.).

Everyone likes a tale of mystery and adventure. In this book, Mr. Barker gives us a total of 14 such tales. He is an expert story-teller, as you will know if you read his earlier books, such as *Down in the Drink* and *The Ship-Busters;* and he could hardly have better raw material than the disappearance of Amelia Earhart or the forced landing of the Liberator bomber *Lady Be Good* in the Sahara in 1943. Nor do all the stories have a tragic ending. In fact, the trans-atlantic flight of "Wrong-Way Corrigan" is still as unbelievably comical as when it happened and well justified Corrigan's unanimous election as an honorary member of the Liars Club of America!

Few books have titles which describe precisely what they contain, and this is true of *Great Mysteries of the Air.* It was hardly mysterious that people who set out on long over-water flights in overloaded aircraft, with inadequate navigation aids, in the twenties and thirties, should fail to arrive at the other end. Nor should it be surprising that aircraft carrying film stars and band leaders disappeared in wartime, when fighters and bombers carrying other men vanished daily in those same skies.

To Mr. Barker's credit, he provides enthralling hints of intrigue to add spice to what might otherwise have been unmysteries. And he produces red herrings with all the skill of an Agatha Christie "whodunnit" before getting to the more probable explanation of what happened on other occasions. Most important of all, however, is that he really knows what he is writing about. This is no tawdry attempt to glamorise the unglamorous by journalistic overwriting. The amount of research done by the author makes each story a useful little work of reference on its subject. Log-books and control tower records are quoted verbatim; facts and figures are recorded and analysed with the patience and precision of a Scotland Yard detective. As a result, one almost sweats it out with Captain Harvey as he tries to reach Northolt in a B.E.A. Viking with its tail partly severed by a bomb.

In short, this is a book that will be equally acceptable to the aviation enthusiast and to the lay reader of mystery novels. That is the measure of Mr. Barker's writing skill.

J.W.R.T.

British Flying-Boats and Amphibians 1909 - 1952, by G. R. Duval (Putnam & Company Ltd., London; 268 pp.; fully illustrated; 50s.).

As the author of an earlier book on the same subject, the reviewer is well able to judge the immense amount of care and effort that Mr. Duval has put into this reference work on all the flying-boats and amphibians known to have been built in the United Kingdom, from the Wyvenhoe Flier (which didn't) of 1909 to the beautiful and tragic Princess of—can it really be so long ago?—1952.

Here is a history of aviation that is complete in itself, for there are no flying-boats under development or construction in Britain today. The Soviet Union has 560-m.p.h. jet flying-boats; American home-builders are producing baby amphibians by the dozen; Japan has a magnificent new maritime patrol flying-boat nearing completion and destined for squadron use. Britain, home of many of the greatest flying-boats of all time, and surrounded by water, just isn't interested.

Maybe it is wrong to say we are not interested. If this were the case, there would be little point in publishing this book. The truth is probably that, as in so many other fields, interest in Britain is now largely historical. As a nation, we appear to regard Beefeaters more highly than bombers like the TSR.2, and to be more attracted to the idea of selling buttered scones to tourists than Buccaneers to air forces. But this is digressing . . .

Even if we are prepared to believe that there is no future for flying-boats, Mr. Duval's book will evoke memories of magnificent machines of the past. Here, for example, is the Short Singapore in which Sir Alan Cobham made a 23,000-mile African survey flight in 1927 - 28; the little Supermarine Sea Lion which prevented an Italian victory in the 1922 Schneider Trophy

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contest and so made it possible for Britain to win the Trophy outright nine years later; the Walrus which hauled innumerable ditched airmen out of the sea in World War 2 and carried beer to thirsty infantrymen; the Empire flying-boats which delivered air mail to every corner of the British Empire without surcharge; the "Mercury" half of the Mayo composite which still holds the seaplane distance record 28 years after it flew non-stop from Scotland to South West Africa; the S.R.A./1 jet flying-boat fighter which Geoffrey Tyson flew the length of the Farnborough runway inverted in 1948, a few feet above the concrete.

It seems almost impossible that all the memories, all the history, all the achievements could have stemmed from just 97 different types of flying-boat; yet this is the total of different basic designs produced by British designers and covered in this book. There are comprehensive details of the lot, three-view general arrangement drawings of most, and photographs of all but the Wnite & Thompson twin-engined boat of 1914, Norman Thompson N.2C and Blackburn N.1B. Recently-discovered pictures of the first of these came to light just too late for inclusion.

J.W.R.T.

The Ships and Aircraft of the U.S. Fleet, by James C. Fahey (United States Naval Institute, Annapolis, Maryland, U.S.A.; 64 pp.; fully illustrated; $3.50).

Eight years have passed since the last edition of this fact-packed little paperback was published. At that time, nuclear-powered surface ships and Polaris submarines were still vessels of the future. Now, on page 4 of this Eighth edition of Fahey's *Ships and Aircraft of the U.S. Fleet,* there is a picture of the carrier *Enterprise,* cruiser *Long Beach* and frigate *Bainbridge,* all nuclear-powered, sailing together. And on page 17 are listed the 41 fleet ballistic missile submarines that will all be in service by next year.

Turning the pages, one cannot help being amazed at the vast size of the present U.S. Navy. All ships, active and reserve, building and authorised, are listed, with basic details, a note on their status and representative photographs of each class. The centre portion of the book, from page 27 to page 41, is devoted to U.S. Naval Aviation, with comparable information and photographs covering every type of aircraft, piloted and pilotless, in the naval inventory.

Such facts, figures and photographs are obtainable nowhere else in such a self-contained, compact form. The standard of accuracy is all that one would expect in a book published by the United States Naval Institute. In fact, the only possible criticism is that the aircraft data tables still cling to the obsolete, pre-1962 aircraft designations, although a "conversion table", relating the old designations to the current ones, is included on page 31. J.W.R.T.

The First Book of Flight, by Jeanne Bendick (Edmund Ward, London; 64 pp.; 7 ins. x 8¼ ins.; very fully illustrated; 13s. 6d. net).

The present generation of youngsters born in the "air age" and growing up in the "space age" have a keen interest in everything that flys, whether aircraft, airships or rockets.

Their parents are bombarded with a stream of questions as to why, when, and where they fly? Some with a personal interest in aviation may know most of the answers, but there will be many who only have the vaguest notion of the right answers to this cross-examination by their children, "losing face" in consequence. For them this "First Book of Flight" will provide most of the answers and re-establish their prestige in the eyes of their offspring.

For most children this book would be a welcome Birthday, Christmas or other present. It contains a simple, lively account of flying machines of all kinds of yesterday, today and tomorrow, providing a good elementary grounding for building-up a sound knowledge of aviation for juveniles.

Hundreds of children domiciled abroad frequently travel to and from the United Kingdom to attend schools there. This book would give an added interest to them on their long journeys by air, which can on occasions be a very boring business.

Youngsters knowledge of aviation is frequently better than that of many adults, it is therefore a book which could be valuable to both. A.H.S.

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Overload of Hope, by John Fores (Hodder & Stoughton, London; 190 pp.; 16s. net).

There are some who believe today that in a short space of years China's growing power, particularly now that she has entered the nuclear field, will cause the U.S.S.R. to join forces with the U.S.A. to prevent a Third World War, from which no nation, however powerful would survive.

The author of "OVERLOAD OF HOPE" bases his fictional story on the signing in 1975 of a pact of this kind, somewhere in the Pacific by the President of the U.S.A. and the Russian Head of State.

This story begins where the President has returned safely to the United States and the Head of State of the U.S.S.R. is on a secret flight in a B.O.A.C. "Concord" to Moscow. Chinese agents have successfully sabotaged this aircraft and it is forced to land on an island in the Pacific, which happens to be a base used by an ex-charter company pilot then flying a vintage "Dove" aircraft on charter missions in that area.

Shortly after landing a Chinese aircraft drops a bomb on this island which puts the "Concord" out of action. Because of the immediate danger of further attacks by the Chinese to wipe out the Russian party and prevent the signed pact reaching Moscow, it is decided to fly some of the Russians to a distant island the other side of the Pacific in the somewhat decrepit "Dove", where they can be safely picked-up by an American aircraft; for the onward flight to Moscow.

The hazards faced on this long flight over the Pacific, landing on very small islands en-route is well told by one who was a navigator himself in World War I, as is his description of the many attacks by the Chinese to kill the U.S.S.R. Head of State. The author packs plenty of excitement into this hazardous flight and keeps readers in suspense right up to the last page.

John Fores succeeds in introducing a mixture of American, British, Russian and Chinese characters, all convincingly described. A.H.S.

Roots of British Air Policy, by Richard Worcester (Hodder and Stoughton, London; 224 pp.; 30s. net).

There can be but few who are naive enough to believe that all is well with British Air Policy: Richard Worcester is certainly not one of them.

His book is a terrible indictment of most of those responsible for it. Not least among them Members of Parliament. He says "The root of many failures lies in the fact that M.P.'s in general are uninterested in defence matters" and that "Parliament's attitude can be best summed up as a disastrous lack of proper concern".

When dealing with contracts and the placing of orders for aircraft he refers to the inability of the Ministry of Aviation to communicate fully with the users and complains of the vagueness of both the Treasury and Ministry of Aviation.

There is a very full description of how air policy is determined at the Ministry of Defence (Air) and a comparison is drawn with that in America.

Richard Worcester springs somewhat of a surprise on those who have spent most of their lives in matter concerning air policy in one way or another when he says "In decades since Lloyd George's time as Prime Minister nobody, until Harold Wilson arrived in October, 1964, had a real grasp of aviation".

Alongside the apportionment of blame for failures there is a great deal of useful constructive criticism and every chapter is a mine of information over the vast field of aviation past, present and future. The chapters on "Jet Fighters and Bombers" and "Armed Forces" should be of particular interest to our readers.

Provocative and controversial it may be! but this is an excellent book, which everyone interested in aviation should have on their bookshelf. It will not only stimulate useful discussion on the vital question of British Air Policy, but it is also a useful reference book.

A.H.S.

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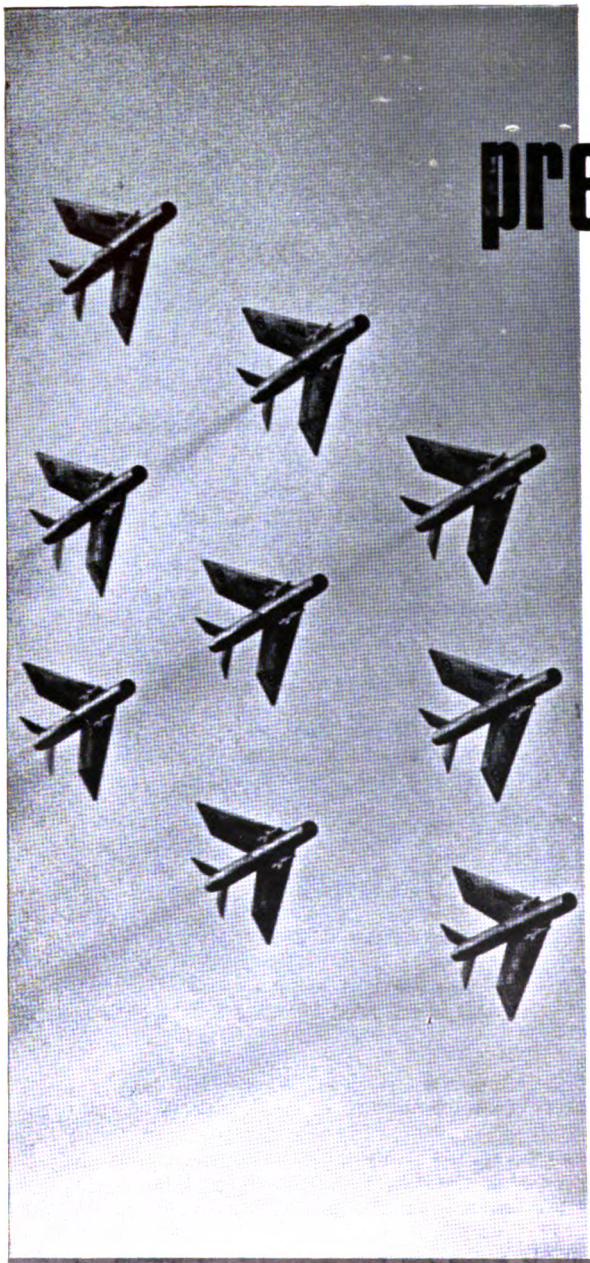

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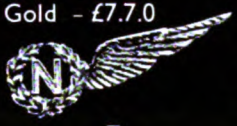

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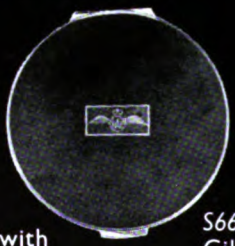

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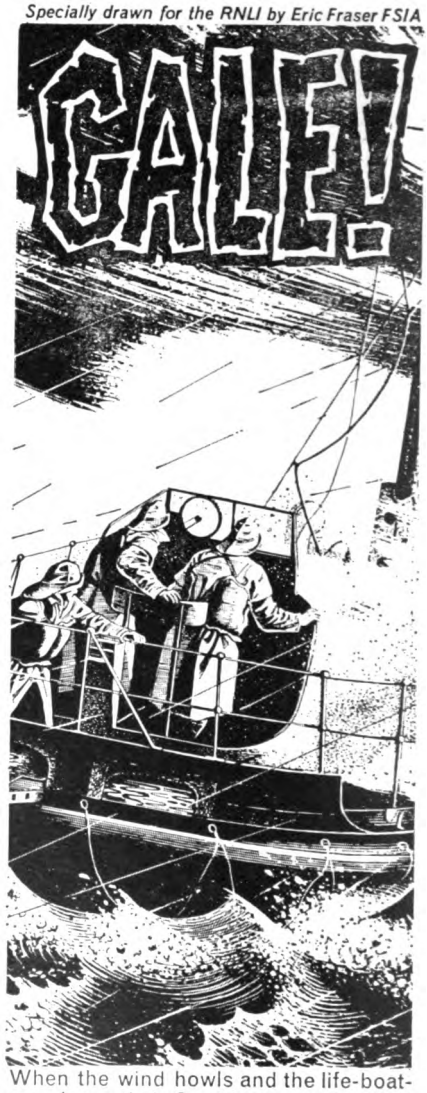

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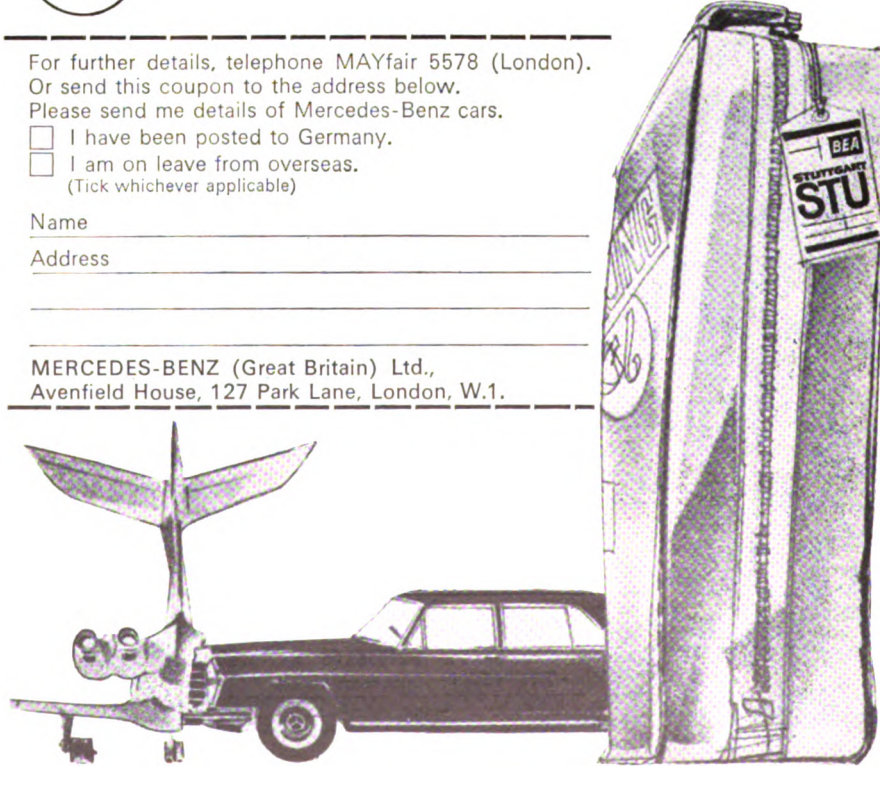

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THE ROYAL AIR FORCES QUARTERLY

(INCORPORATING THE JOURNAL "AIR POWER")

Volume 6 WINTER 1966 No. 4

EDITOR:

GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RETD.)

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FLYING TRAINING TODAY — R.A.F. VALLEY
Student and instructor about to enter the cockpit.
(See article on Flying Training Command)

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EDITORIAL

TECHNOLOGY and DEFENCE

AFTER a decade or two without a major war, the British people begin to believe that peace is theirs for the asking, and that adequate defence forces are a needless and foolish extravagance. This curious attitude does much to explain the hopelessly ineffective and even obsolete state of our armed forces at the time of the Crimean War, 1854, the South African War, 1899, and at the time of Munich in 1938.

If we think about war at all in these days, it seems to be only in the context of forcing some small but tiresome country, like Rhodesia, to conform to our ideas of how it should order its affairs.

At the present time, we are hearing constant demands to cut our forces, reduce our reserves and stocks of warlike stores, contract out of our alliances, and withdraw from our overseas bases. Worst of all, we hear insistent claims that far too large a proportion of our scientific and financial resources is employed in research and technical development for defence purposes, instead of being devoted to the things that really matter, such as colour television, faster and cheaper cars, improved household appliances, and more lethal insecticides.

This is a great challenge to our statesmanship, for it is true to say that, now and at all times, there is no field in which scientific research is more important than in that of defence. A scientific "break-through" in this field can make weapon systems obsolete almost over-night, and it is possible to spend thousands of millions on out-of-date defence forces, which are quite useless and give no protection whatsoever.

The classic modern instance of this is, of course, the atom bomb. In the spring of 1945, the island-hopping campaign in the Pacific had brought the American heavy bombers within range of the Japanese mainland. By the end of July a sustained and accurate air bombardment had brought Japan to the edge of defeat, but by August of that year she had shown no overt signs of surrender. Indeed, the United States Army and Navy, who seldom agreed about anything, were united in their view that Japan could be subdued only by a massive invasion, which was already being prepared and was timed to take place in the autumn.

The two atom bombs dropped on Hiroshima and Nagasaki, in early August, put an immediate end to the war. Japan, the proudest and most self-conscious military nation on earth, with an unbeaten army of over one and a half million standing ready to die to the last man in defence of their homeland, surrendered unconditionally. For a loss of some 100,000 lives at Hiroshima and Nagasaki, the invasion, which it has been estimated would have cost a quarter of a million Allied lives and killed at least a million Japanese, was rendered unnecessary.

If the Allies had possessed the atom bomb eighteen months earlier and had used it against Germany in the spring of 1944, the war would have been shortened by a year,

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and a vast number of lives, Allied and German, would have been saved.

Or think what would have happened if the Germans had been the first to develop the atom bomb, and had used it against this country in the spring of 1944. Our invasion of the Continent would have been impossible, and indeed it is probable that Germany would have extricated herself from a hopeless position, and won the war. The whole course of recent European history would have been profoundly changed.

Apart from being the keystone of our security, research for defence purposes over the last fifty years has produced a vast and beneficial "fall-out" in aid of civilian life and industry. Tracked and other cross-country vehicles, light metal alloys, radar, a whole range of plastic materials, jet propulsion, and the harnessing of atomic energy are only some of the most important contributions made by defence research to our industrial life.

There is everything to be said in favour of concentrating on defence research. Not only is it the best way of ensuring our safety in a dangerous and warlike world, but it is the very spearhead of our general technological development. It is a major stimulant of our inventive genius, and a principal means of organising our scientific resources to cope with the technological revolution. This is especially true of the aero-space industry.

A reduction now of our defence research programme would be a victory for muddled thinking and pacifist prejudices, and could not fail to be a severe blow to our industrial future.

R. SAUNDBY,
Air Marshal (Ret'd).

READERS CRITICISMS INVITED

We hope the contents of this Journal comes up to the expectations of subscribers.

Our ambition is to please *all* of our readers *all* of the time; perhaps this is too ambitious!

It would be very satisfying if we could meet the approval of *most* of our readers *most* of the time.

The only means of doing this is by subscribers sending the editor their observations, criticisms and suggestions as to the kind of articles that interest them and, of course, those that do not.

Our aim is to produce a journal of a standard high enough to be worthy of our Air Forces, and one that is at least comparable with those of other Services.

It would be greatly appreciated if our readers would co-operate with the maintenance of this aim by writing to the editor in time to include their suggestions in the planning of the contents for issues in 1967.

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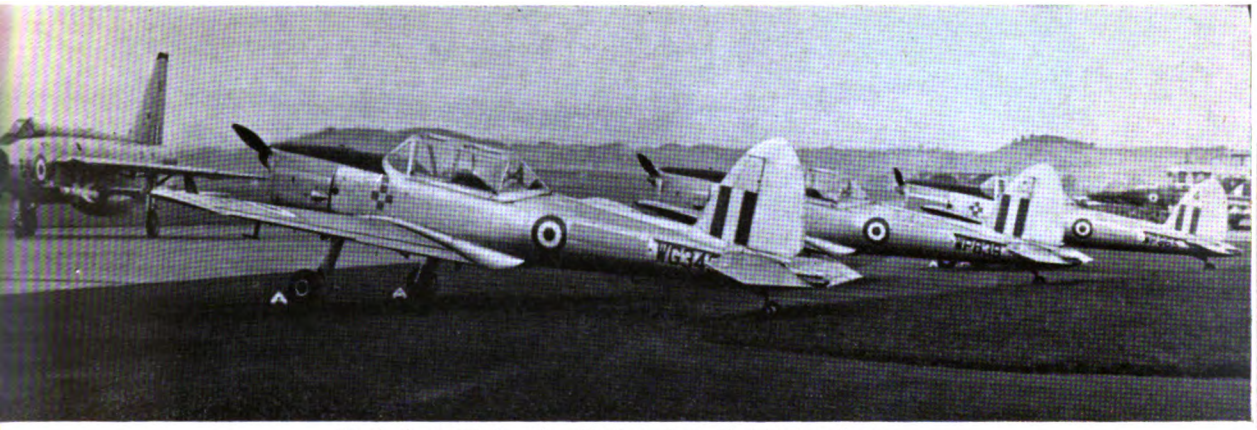

St. Andrews University Air Squadron, R.A.F. Leuchars

Flying Training Command

By Air Marshal Sir Patrick Dunn, K.B.E., C.B., D.F.C.

ON their own, aircraft, weapons, equipment and installations mean little. Without a well trained human complement, they can never be fully effective and may be completely ineffective.

Dramatic though the advance in weapons systems has been, the matching advance in knowledge and professional competence of the men and women who work them is also remarkable. Indeed, if their minds and hands had not matched, and mastered, the power and sophistication of the machine, technological progress would be embarrassing.

In Flying Training Command the foundation of professional competence is laid, mainly for those who fly but also for many whose duty will keep them on the ground. Those who fly will be translated from walking pace to supersonic speed in about two years; those who are to work in the ground environment must be educated to a corresponding pitch.

Training—education—define it as you choose, is therefore the rock upon which all else is built or founders, and the quality of the training organisation determines which it is to be.

Range of Responsibility

Flying Training Command, as the name implies, has as its prime responsibility the *ab initio* flying training of aircrew (in which officer training is implicit). But it does not stop there. *Ab initio* students in training for ground specialisations allied to flying and post-graduate students, on both flying and ground courses, make varied and possibly more numerous demands. University Air Squadrons constitute a variant

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of the Command's prime duty, and surveillance of and responsibility for a great deal of the Air Training Corps add weight to the burden. In all these, officer training is implicit. There is also a role in emergency and a war role to be planned and practised.

THE COMMAND TODAY

Function, Organisation and Scale of Effort

Today, the Command is deployed from Aberdeen to Exeter. It is about 15,000 strong, has about 800 aircraft and 280 gliders: at any one time the number of students is about 3,100. Of these 65% are doing *ab initio*, refresher or post-graduate flying training.

It is composed of two Groups and six formations of Group status.

No. 23 Group (Air Vice-Marshal M. D. Lyne, A.F.C., A.F.R.Ae.S.) is responsible for the basic and advanced training of Royal Air Force and Royal Navy pilots. No. 25 Group (Air Vice-Marshal R. I. Jones, C.B., A.F.C.) is responsible for the Initial Training School, the Basic and Advanced Navigation Schools, the Central Air Traffic Control School, the Air Electronics School and eighteen University Air Squadrons.

Other formations of Group status are:

a. The Royal Air Force Central Flying School, Little Rissington.
b. The Royal Air Force College, Cranwell.
c. The Royal Air Force College of Air Warfare, Manby.
d. The Royal Air Force Staff College, Bracknell.
e. The Officers' and Aircrew Selection Centre, Biggin Hill.
f. Headquarters' Air Cadets and its subordinate formations.

The Staff College, Selection Centre and Air Cadets are functionally controlled by the Ministry of Defence, but their administration and technical control are the responsibility of Command.

In 1965, about 285,000 flying hours were logged, which is as much as the rest of the Royal Air Force in the United Kingdom. For example, No. 23 Group flew almost as many hours as Transport Command, and No. 25 Group flew more than Bomber Command.

SELECTION AND TRAINING

It is in the *ab initio* field—attracting, selecting and training enough of the best youth of the country—that we stand to score the most significant success or suffer the most significant damage.

Of those who present themselves (and all aircrew candidates do so) at the Officers' and Aircrew Selection Centre (Air Commodore H. P. Connolly, C. B. D.F.C., A.F.C., A.F.M.), fewer than one in four is accepted for aircrew training. This is not surprising: the Service requires so much.

Firstly, aircrew must pass a stringent medical examination, be highly intelligent and of good education. Secondly, the candidate must want to fly and have the aptitude for it. Thirdly, he must have integrity and the raw character which can be

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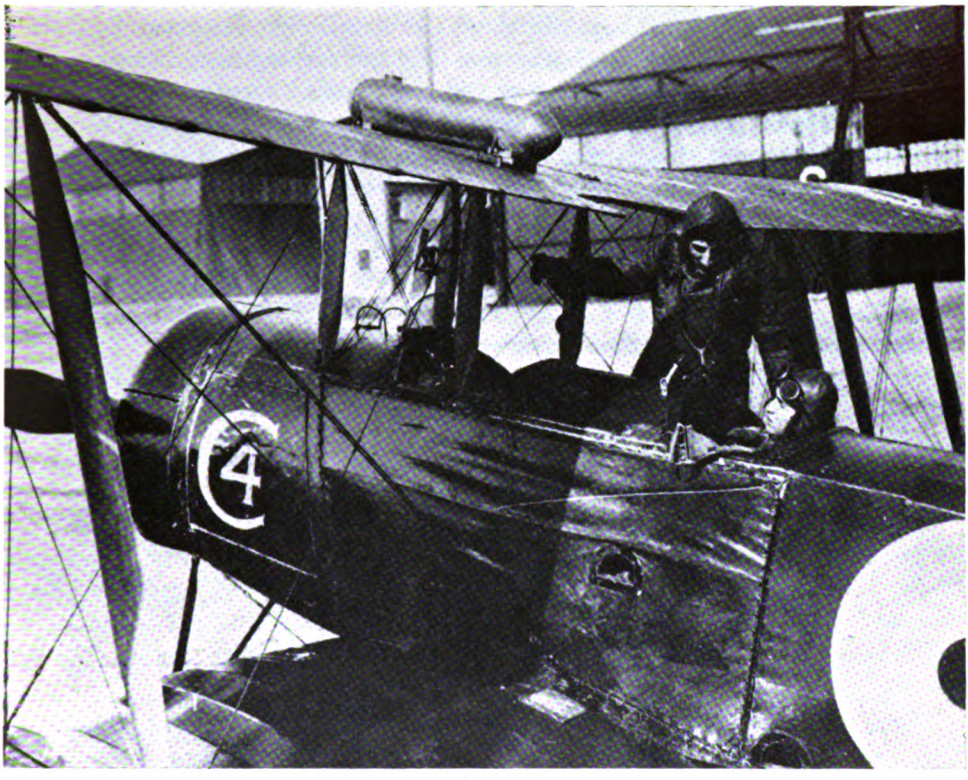

1923
AVRO 504K, CRANWELL, 43 YEARS AGO
Instructor: Flying Officer H. A. Crommelin;
Pupil: Flight Cadet A. D. Gillmore (now Air Vice-Marshal A. D. Gillmore C.B., C.B.E., R.A.F. Retired)

cut to officer pattern. He must enjoy a mobile life. Nothing less is good enough. Industry is in direct competition for aspirants with some of these qualities: only the Royal Air Force requires them all. That we secure, in the face of such competition, enough candidates of the right calibre may at first sight seem surprising. It is not: but it is cause for quiet satisfaction. One should not overlook or under-estimate the contribution to recruiting made by University Air Squadrons, the Combined Cadet Force and Air Training Corps. In recent years about 40% of aircrew entrants have an A.T.C./C.C.F. background. We should not too readily accept the doctrine of progressive deterioration: there are still many young men who want more than comfort and cash. Nor should one overlook the intrinsic attraction of Service life, of serving one's country, and by the education and experience enjoyed, of serving oneself. And all these advantages have been well advertised.

Training Sequences

Royal Air Force College, Cranwell (Air Vice-Marshal I. D. N. Lawson, C.B., C.B.E., D.F.C.). An entrant to the General List, unless he is a University graduate or a Special Entrant (of whom there are very few), proceeds as a flight cadet to the

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Royal Air Force College, Cranwell, where General Duties, Engineer, Regiment, Equipment and Secretarial Branches receive their training together. For those who start as Engineer flight cadets the course will last 4 years 8 months, commissioning taking place at the end of 2½ years. After the first year's training these cadets are split into two streams, one stream working for a Bachelor of Science (Honours) Degree and the other for a Higher National Diploma. General Duties, Regiment, Equipment and Secretarial flight cadets undergo a 2½ year course comprising General Service Training, academics and a full flying course for G.D. officers only. Certain cadets of ground branches will have the opportunity to do some flying in Chipmunks and Jet Provosts. The pattern for the G.D. (pilot) flight cadet consists of six months General Service Training combined with academics and Chipmunk flying. Thereafter comes the academic year when no flying is done. His last year is almost identical to that spent by an *ab initio* pilot at a Basic Training School. The navigator is comparably educated.

Initial Training School (*South Cerney*) (Group Captain J. V. Marshall, D.F.C.).

Entrants to the Supplementary List (and to the General List from University or Special Entry) face the first stage of their training at I.T.S. Here they are introduced to the Service way of life and the duties and responsibilities of an officer. As a preparation for professional training, they undergo a revision course in academics which is essential if they are to keep pace with the course of flying training they will follow.

Those student pilots without previous flying then do five weeks primary training on Chipmunks to teach them airfield procedures, basic airmanship and to fly in an uncomplicated aircraft where systems and drills do not seriously impede the acquisition of flying skill. It is *not* a grading device: it is *no* part of the selection system.

Basic and Advanced Training

After initial training, the student pilot proceeds for 45 weeks to a Basic Flying Training School where he is trained on a Jet Provost. Thence he graduates to an Advanced Flying Training School for Gnat (24 weeks), Varsity (24 weeks), or helicopter (20 weeks) flying, depending on the operational role for which he is destined.

Navigators undergo their professional training in two stages: Basic (32 weeks) and Advanced (16 weeks) at Gaydon and Stradishall respectively, on Varsities, Valettas and the Dominie.

Air electronics operators go to Topcliffe where their course on Varsities lasts a year.

Training Success Rate

Pilot training is the most difficult, the most expensive and the most important charge laid upon Flying Training Command. In 1961 only one out of two students graduated. Today, just under four out of five successfully complete the course. Among navigators, three out of four completed the course in 1961: today, nine out of ten do so. And the rate of improvement is similar in the air electronics field.

Is this improvement due to improved methods of selection, improved methods of

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training or to something else? Answer—it is due to something else. Certainly improvement in selection and methods of training have occurred and bring advantages. But the dramatic advance is owed to an uncompromising outlook and purpose —to train successfully. If one looks for failures one finds them. If one aims only at success, one succeeds. Training, not selection, is the purpose of Flying Training Command.

POST-GRADUATE AND OTHER COURSES

Central Flying School (Air Commodore F. L. Dodd, D.S.O., D.F.C., A.F.C.).

In pilot training the most important man is the flying instructor. It is upon the Central Flying School that the calibre and output of flying instructors chiefly depends. C.F.S. can claim to be the oldest military flying training unit in the world—it is certainly older than the Royal Air Force itself—and it was there that systematic flying instruction originated. Today, the School has the power and the resources to improve the standard of pure flying, and to increase the number of pilots who can be brought to that standard throughout Flying Training Command.

C.F.S. was formed on 12th May, 1912, and in 1920 became the Flying Instructors' School. Since then, its aim has been to train flying instructors who, by their skill, knowledge and enthusiasm, maintain the flying efficiency of the Royal Air Force. Today, C.F.S. comprises both fixed-wing and helicopter elements which undertake the training of all Flying Instructors in the Royal Air Force, Royal Navy and Army Air Corps, and some for certain other air forces. Additionally, C.F.S. provides an inspectorate, the Examining Wing, whose duty is the quality control of flying training throughout the Command, and indeed throughout the Service.

An important side-line is the provision of the Royal Air Force Aerobatic Team "The Red Arrows", composed entirely of flying instructors of appreciable experience, mounted in Gnats. Formation aerobatics is the ultimate expression of pure flying skill and it is appropriate that the team should come from the C.F.S. whose preoccupation is with pure flying.

Royal Air Force College of Air Warfare (Air Commodore C. B. Brown, A.F.C.).

At the Royal Air Force College of Air Warfare, doctrine is taught, discussed, debated and the scope of operational problems, posed by scientific and technological progress, absorbed. This valuable course will help its graduates, Wing Commanders and Group Captains, later to exercise more effective influence in their command and staff appointments. There is also the "Specialist Aero Systems Course" for pilots, navigators and air electronics officers of about Squadron Leader rank, to equip them for important staff, research and development appointments.

Other qualified navigators are trained for instructional duties in junior staff appointments on the Staff Navigation Course. Many then go as instructors to the Air Navigation Schools and thereby help to set and maintain the standard of navigation training in the Command, and therefore of navigation throughout the Royal Air Force.

A Weapons Employment Course and the Aerospace Indoctrination Courses are important adjuncts to enable a large number of officers to be kept well informed of

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1966
THE "RED ARROWS"
R.A.F. Aerobatic Team in formation

developments in applied military science; other allied courses are held *ad hoc* from time to time.

Manby also runs the School of Refresher Flying for officers who need it. Courses are tailored to suit the individual, from Pilot Officer to Air Officer, the aim being to secure him a current instrument rating.

Central Air Traffic Control School (Group Captain M. C. Bunting, M.B.E.).

Air traffic controllers, radar approach controllers and assistant air traffic controllers are trained at Shawbury. This is a large, unobtrusive yet important commitment. Air traffic is dense, and the ground control system is becoming complex. If it is not to become restrictive, ground controllers must be quick, dexterous and professionally as competent as their counterparts in the air.

UNIVERSITY AIR SQUADRONS

From an idea conceived in 1919 by Lord Trenchard, which found expression in the formation of air squadrons at Oxford and Cambridge, University Air Squadrons have made an important contribution to the work of the Royal Air Force, in war and peace.

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Today, there are eighteen squadrons comprising about 800 undergraduates who, in the main, are members of pilot flights. In addition, two universities (Nottingham and Southampton) also support engineer flights open to students reading engineering, chemistry, physics and mathematics.

The work of the squadrons is an integral part of the work of Flying Training Command, promoting interest in the Royal Air Force at the University and, as a by-product, attracting entrants of good character and learning into the Service.

EMERGENCY AND WAR ROLE

Training is sometimes affected by calls upon personnel to reinforce overseas commands in an emergency. A very large number of ground tradesmen are often on standby, ready to move speedily and efficiently at short notice. Many have in fact been moved. This is a tiresome but obviously necessary intrusion into the training routine.

In both emergency and war, the Command has to support the Operational Commands with aircraft, vehicles and personnel, and is the biggest provider of such reinforcements.

Should a nuclear exchange occur, then the Commander-in-Chief becomes the Air Commander-in-Chief of the United Kingdom, and with his opposite numbers in the Army and Navy would help, from the Central Seat of Government, to direct the survival and recovery of the Nation.

THE FUTURE

In less than four decades, aircraft have developed from stick and string bi-planes to the Lightning, 'V' bomber and VC10. More powerful and relentless aircraft, and weapons systems, are in sight. Re-equipment will compel continuous transformation in techniques and organisation: the old must continuously give way to the new if Britain is to survive in recognisable form.

Thus the range of skills and technologies must expand; yet numbers in the Service are to contract and two Training Commands will no longer be justified or necessary. Therefore, Technical Training and Flying Training Commands are to merge in June, 1968, to form Training Command.

Over the years, Flying Training Command's cardinal task, to train aircrew and certain others for entry to the Operational Commands, has not altered. It is beyond dispute that training must be done, and done well, and it must start right at the beginning. Consequently, Flying Training Command enjoys comparative immunity from intervention and is allowed to get on with its very exacting but rewarding task. It is fervently hoped that after the merger, the new Training Command will be similarly fortunate.

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AIR MARSHAL SIR PATRICK DUNN, K.B.E., C.B., D.F.C.

CAREER BRIEF

Air Marshal Sir Patrick Hunter Dunn, K.B.E., C.B. D.F.C., was Air Officer Commanding-in-Chief, Flying Training Command from 26th June, 1964, to 30th September, 1966. He was previously Air Officer Commanding No. 1 (Bomber) Group from 1961 to 1964, Deputy Air Secretary at the Air Ministry from 1959 to 1961 and Commandant of the Royal Air Force Flying College, Manby, from 1956 to 1958.

He was born in Glasgow and educated at Glasgow Academy, Loretto and Glasgow University.

Commissioned in the Royal Air Force in 1933 he saw pre-war service in flying boats and as a flying instructor in No. 500 County of Kent Squadron and at the Central Flying School; he captained a Wellesley in the Long Range Development Unit (1938). His war service included the command of two fighter squadrons—No. 80 (Gladiators) and No. 274 (Hurricanes)—and No. 71 Fighter Operational Training Unit in the Middle East. After a tour of duty at the Air Ministry, where his duties included Personal Staff Officer to Marshal of the R.A.F. Viscount Trenchard, G.C.B., O.M., G.C.V.O., D.S.O., he was appointed Group Captain, Director of Operations, at No. 12 Group (1944) and Eastern Sector Commander in Fighter Command in 1945.

Post-war appointments include those of S.A.S.O., A.H.Q., Malaya (1949-50), Directing Staff at the N.A.T.O. Defence College, Paris (1950-52) and Group Captain Plans and Air Commodore Operations at H.Q. Fighter Command (1953-56).

He was an A.D.C. to the Queen from 1953 - 1958.

Air Marshal Dunn is a past President of the Royal Air Force Hockey Association and the Royal Air Force Gliding and Soaring Association. He has been a Trustee of Loretto since 1959.

He is married with two daughters.

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PHOENIX WITH CLIPPED WINGS

— John W. R. Taylor surveys the reborn German Aircraft Industry —

IF you glance down the list of members of the Bundesverband der Deutschen Luft— und Raumfahrtindustrie, German equivalent of the Society of British Aerospace Companies, the great names of pre-war and wartime vintage seem to be overshadowed by strange newcomers. It is only when one studies the lists of shareholders and executives of the anonymous and almost unpronounceable new leaders of the industry that a more familiar picture begins to emerge.

Take, for example, Vereinigte Flugtechnische Werke GmbH (VFW), with headquarters in Bremen, other works at Einswarden, Hoykenkamp, Lemwerder, Speyer and Varal, and a total of 10,000 employees. It transpires that this company resulted from a merger of the former Focke-Wulf and Weser companies, joined subsequently by Heinkel. Its management committee contains the names of some of the greatest living German aeronautical engineers and administrators, with a lifetime of practical experience behind them. Its shareholders include Fried Krupp (29.28%) and, significantly, United Aircraft Corporation of the U.S.A. (26.37%).

It is difficult to imagine a company with greater potential, and the same is true of the second major German consortium, Interessengemeinschaft Luft—und Raumfahrt, München (IGLR). This group has two operating companies, named BMS-Flugtechnik GmbH and BMS-Flugzeugbau GmbH, the "BMS" standing for Bölkow, Messerschmitt and Siebel. Here again are some of the old great names, with a similar wealth of talent on the executive masthead.

Why, with such an industry at its disposal, does the *Luftwaffe*, twenty years after the war, find itself flying not-very-satisfactory fighters of American and Italian origin, outdated piston-engined transport aircraft of French design, and jet trainers and helicopters also designed in France? One answer is that the industry has been gaining experience of the latest aircraft design and production techniques by undertaking licence manufacture of foreign types. The other answer (with an all-too-familiar ring to British ears) is that the German government has failed to give the industry the full support that it deserves, believing it to be more economical and convenient to produce and put into service aircraft already developed and well proven abroad.

The inadequacies of the *Luftwaffe's* Fiat G91 reconnaissance/strike fighters, and the tragic history of its Lockheed F-104G Starfighters, resulting from this policy might, if nothing else, make Mr. Wilson, Mr. Healey, and whichever minister will be responsible for our own industry in future, feel somewhat apprehensive about their own "buy American" policy for the R.A.F. and Royal Navy.

There has certainly been no shortage of promising ideas from the German industry in recent years, extending even into the realm of 400 m.p.h. compound helicopters and

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"space transporters" for air-launching orbital transport aircraft. Before they became part of VFW, Heinkel projected an interesting 24-seat twin-jet transport, the He 211 B-1, with the engines buried inside the rear fuselage and fed by a unique annular air intake. Intended to meet a requirement of the national airline, Lufthansa, for a machine to operate over its shorter routes, this aircraft failed to receive official support, as did Siebel's SIAT 311A, a 17-passenger rear-engined twin-turbofan short-haul transport with unusually good short take-off and landing performance.

In 1962, Siebel won a competition for a standard touring and training aircraft for German flying clubs, organised by the Ministry of Economics and the Wissenschaftliche Gesellschaft für Luft—und Raumfahrt, which can best be described as a German "Farnborough". Four years were lost before the announcement could be made in the Spring of this year that a prototype of the winning design, the SIAT 223, was at last under construction. First flight date was predicted as August, 1966; but there were no very apparent signs that the prototype had been completed when this article was written, at the beginning of November.

Meanwhile, Lufthansa is rapidly becoming an all-Boeing airline, with a present or planned fleet of Boeing 747 "jumbo jets" and 707's for its long-distance services, 727's for medium stage lengths and 737's for short-haul services.

Plans to follow the *Luftwaffe's* F-104G Starfighters with the new F-104S version, which is being built under licence in Italy, have been abandoned for obvious reasons. Instead, it seems likely that Germany, like Britain, will settle for the McDonnell Phantom II. If it does so, Britain will derive some commercial benefit, as the *Luftwaffe* will almost certainly choose the much superior version powered by Rolls-Royce Spey turbofan engines. But there are many people who believe that Germany would have fared better if her politicians had chosen the British Lightning or French Mirage instead of the Starfighter, and the now-abandoned Hawker Siddeley P.1154 vertical take-off fighter instead of the Phantom. German interest in the P.1154, following the *Luftwaffe's* participation in the P.1127 joint evaluation squadron, would almost certainly have saved the project, and the R.A.F., too, would have been able to equip with this potentially unrivalled supersonic VTOL fighter. One can only feel relieved, in retrospect, that contracts for the Spitfire and Hurricane in the late 'thirties were not made dependent on the aircraft being ordered also by a foreign air force!

Clearly, then, the highly capable German aircraft industry is as much in the incapable hands of politicians as is its British counterpart. This must be borne in mind when one relates its current advanced ideas and prototypes to the present and planned future equipment of the *Luftwaffe* and Lufthansa.

Taking the major companies alphabetically, Bölkow GmbH is first, as the member compaines of the IGLR are continuing to operate under their own names for the time being. It is a comparative newcomer, having started life as a civil engineering office opened by Dipl.-Ing. Ludwig Bölkow at Stuttgart in 1948. It moved to Ottobrunn, near Munich, ten years later and formed a separate company named Bölkow-Apparatebau GmbH at Nabern/Teck, to handle manufacture of its products. Today, there are 2,750 employees at Ottobrunn and 860 at Nabern.

Bölkow began by taking over production rights in the Klemm Kl 107 three-seat

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light aircraft, which it refined eventually into the four-seat Bölkow 207. Although fully aerobatic and pleasant to fly, this wooden machine, of rather dated design, faced impossible competition from the all-metal, mass-produced American Cessnas, Pipers and Beechcraft which have flooded the European market, and production ended last year.

Today, the only complete powered aeroplane in production at Nabern is the Bö 208C Junior light two-seater, powered by a 100 h.p. Rolls-Royce Continental engine. It is an interesting little machine, having originated as the BA-7 "home-built" design by Bjorn Andreasson, then a design engineer with Convair in America. Malmö Flygindustri of Sweden persuaded Andreasson to join them as head of their newly-formed Aircraft Division about six years ago, and put the BA-7 into production in slightly modified form. Bölkow acquired licence rights in the design and the little "home-built" has since been coming off assembly lines in two countries at a respectable rate, to meet home demands and export orders from all over the world, including Britain and the United States. Malmö have even hung rockets and wire-guided anti-tank missiles under the wings of one version, converting it into the Mili-trainer; but the Bö 208C remains strictly for pleasure, on wheels or floats.

However, the company's interests range far more widely than merely building light aircraft. It pioneered the development of a new kind of helicopter pilot trainer, by building a small single-seat helicopter, with a unique single blade counterbalanced rotor, and then mounting it on a pontoon base and limiting the lifting capability, so that novices could practice take-off, flying forward, backward and sideways, turns and landing, without ever getting properly airborne and with no risk of accident. The device was bought for the German armed forces and helped to launch Bölkow into a succession of helicopter projects.

It experimented for some years with the Derschmidt "lead-lag" rotor, which attempted to overcome the problems of tip-stall and compressibility at high speeds by articulating the blades so that they could advance and retard 40° each side of normal during each revolution. The idea seemed promising and practical; but latest news is that further development of the Bö 46 experimental helicopter fitted with the Derschmidt rotor has been suspended. Instead, Bölkow is concentrating on development of the fairly conventional four/five seat Bö 105, powered by two 250 s.h.p. MAN Turbo shaft-turbines, under German government contract. Although this craft is said to meet a *Luftwaffe* requirement, large German orders for the French Alouette and American Bell UH-1D make its future seem questionable.

In developing their helicopter trainer and Bö 105, Bölkow have perfected a very interesting new rigid unarticulated rotor with foldable glass-fibre blades. This has been fitted to a French Alouette for flight testing and it is significant that Sud-Aviation's next-generation SA 340 helicopter, designed to supersede the Alouette, makes use of a rotor of this type, developed in partnership with Bölkow. In view of the French company's own proven ability and leadership in the helicopter field, this represents a considerable achievement for Bölkow's design team.

Inevitably, when one begins studying the activities of a current German company like Bölkow, there emerges a tangled skein of technical and industrial links with

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other companies. Some of these owe their origins to associations formed for licence production of foreign designs like the Starfighter, G91, Magister trainer and Noratlas transport. Others result from purchase of interests in fellow-members of the aircraft industry.

Thus, Bölkow has a 25% interest in Entwicklungsring-Süd (EWR-Süd), an association formed to develop a VTOL fighter, of which more later. It has a one-third interest in a lightplane consortium known as Leichtflugtechnik Union GmbH, formed jointly with Pützer and RFB, which does not appear to have been very fruitful so far. It owns a two-thirds share of Waggon-und Maschinenbau AG, the parent company of Siebel, and has a half-interest, with Entwicklungsring-Nord (ERNO) in Arbeitsgemeinschaft Satellitenträgersystem (ASAT), which is building the third stage of the ELDO European space launch vehicle, of which the British Blue Streak forms the first stage.

With so many tie-ups, one begins to feel that not only are all companies in the German industry brothers but that some must be their own grandfather. To confuse the picture further in the case of Bölkow, Boeing of America have a one-third share in the company, while Nord-Aviation of France also hold a minority interest.

Dornier remains something of an exception, carrying on in glorious isolation. It was involved in licence production of both the Starfighter and G91, as a member of the relevant production teams, but this ended with the delivery of the last of the 294 German-built G91's on May 26 this year.

In any case, whilst playing a major part in these programmes, Dornier continued to produce aircraft of its own design in impressive numbers—the only German company to do so since the war, unless we count the Bölkow/Klemm lightplanes and the little wooden two-seaters built by Pützer.

The key to this singular success may be that Dornier, profiting from previous experience of production abroad, set up a design office in Spain soon after the war, when aircraft manufacture was still forbidden in Germany. The prototype Do 25 single-engined STOL monoplane, built in Spain, was refined into the now-familiar Do 27, which seats two persons side-by-side on the flight deck, with a separate cabin for four to six persons further aft. With its full-span double-slotted flaps and ailerons, and full-span leading-edge fixed slots, the standard 270 h.p. version of the Do 27 takes off in about 200 yards with a full load and lands in under 100 yards. It met ideally the needs of the newly-formed German Air Force and Army, which ordered 428 after the ban on aircraft work had been lifted and Dornier had re-established themselves at Friedrichshafen and in a factory at Neuaubing, near Munich. It was built also in Spain for the Spanish Air Force, and other military and civil orders, many from abroad, raised total production to 620. Manufacture has now ended, although the jigs are kept available in case of further orders.

In parallel with the Do 27, Dornier produced a twin-engined STOL transport designated the Do 28. This utilises the same basic airframe, with the wing span increased by the insertion of a centre-section, and with two 250-290 h.p. engines carried on stub-wings instead of the single engine of the "27". It achieved reasonable success,

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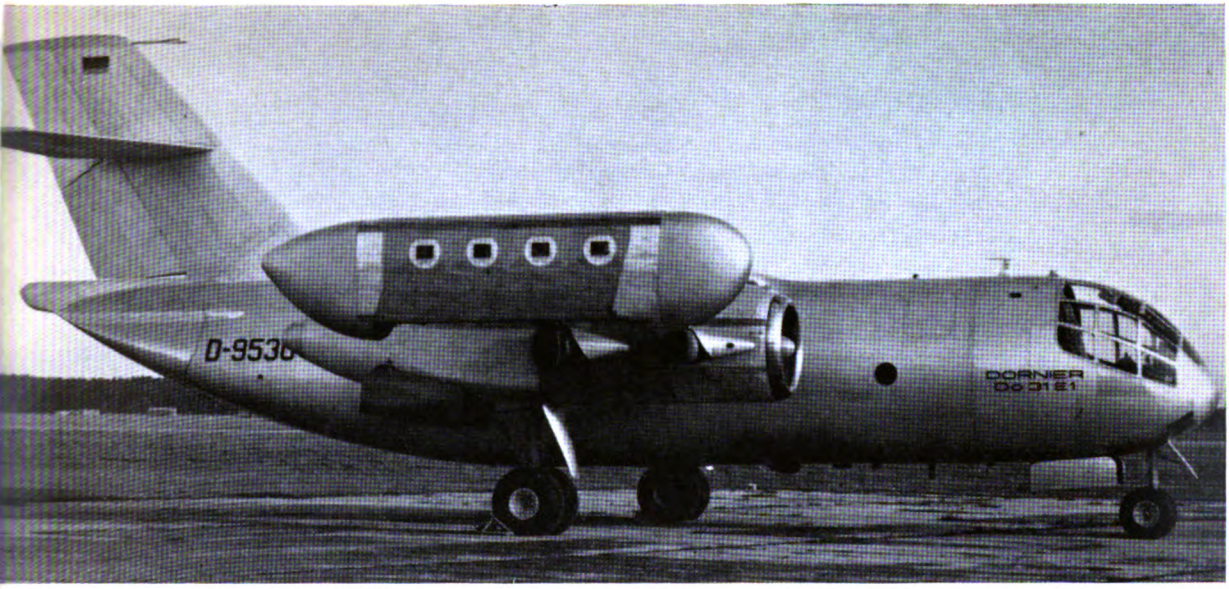

Dornier DO.31. V/STOL transport. One of most important current German programmes. Britain was sharing in it, but Government pulled out. Bristol engines.

a total of 60 of the original Do. 28 A-1 model being sold, followed by a number of more powerful B1's; but Dornier realised that the full potential of the formula would be exploited only by a major redesign. This they have now done and the prototype Do-Skyservant (originally Do 28D) flew for the first time on February 23, 1966. It is a practical-looking 11/13 passenger machine, similar to the Do 28 in general lay-out and with two 380 h.p. Lycoming engines mounted on its stub-wings. It is designed to cruise at 158-186 m.p.h. and to have even better take-off performance than its predecessor, requiring a run of only 170 yards with full load in zero-wind conditions.

Backed by the Ministry of Economics, the Skyservant looks the kind of aircraft that should sell well, even against strong competition from machines like the Swiss Turbo-Porter and British Skyvan, and should help to provide Dornier with their bread and butter for some years. The jam will probably come from research and development contracts, for Dornier has some extremely interesting and advanced programmes under way at the moment.

Most enterprising, because it represents the only hardware in the world in a class of aircraft that all air forces need, is the 400 m.p.h. Do 31 V/STOL tactical transport. In its prototype form, this is a transport for 36 fully-equipped troops, 24 stretchers or an equivalent weight of vehicles or freight, loaded via a rear ramp. The all-British power plant consists of a pair of Bristol Siddeley Pegasus 5 vectored-thrust turbofans, of the kind fitted to the Hawker Siddeley P.1127, in underwing pods, plus two groups of four Rolls-Royce RB.162 lift-jets in wingtip pods.

The lift-jets will not be fitted for the first flights of the Do 31E prototype, which came off the assembly line on November 30, 1965; but extensive "flying" of the design has already been done with a pair of test-rigs. The first of these was a "super

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bedstead"; the second is a more realistic replica of the Do 31, capable of everything but transition from vertical to horizontal flight but installed on a universally-jointed pylon for initial testing.

If the Do 31E prototype fulfils its promise and the German government finds the money, it could give the *Luftwaffe* a transport aircraft that will be the envy of the world. Britain had a stake in the programme at one stage, through a technical collaboration agreement with Hawker Siddeley, but this was not yet another victim of the British government's economy axe. Nobody has yet convinced Mr. Wilson, it seems, that a VTOL fighter like the P.1127 can do its job properly only if it is supported by a VTOL transport to deliver fuel, weapons, equipment and servicing personnel to the jungle clearings, beaches, roads and other off-runway sites from which it is capable of operating.

Nor does the Do 31 represent the limit of Dornier's experimenting at the moment, for it has evolved from its little Do 32 experimental one-man helicopter an unpiloted drone capable of battlefield surveillance, reconnaissance or ship-based anti-submarine search missions, under remote control.

Add to all this the fact that Dornier is prime contractor for German licence production of the Bell UH-1D helicopter, with a first order for 202 machines, and a manufacturer of major components for the Breguet Atlantic maritime patrol aircraft, and it is clearly a company that can face the future with confidence.

The same is hardly true of EWR-Süd, formed in 1959 by Bölkow, Heinkel and Messerschmitt. Heinkel later withdrew, and the shares are now held by Messerschmitt (50%) and Bölkow/Siebel (50%).

Task of EWR-Süd, with government backing, was to evolve the optimum Mach 2 VTOL fighter for the *Luftwaffe*. They began by designing and building two prototypes of the single-seat EWR VJ 101C. This was an interesting machine, as it attempted to overcome the stability problems that plague most VTOL jets by dispensing with the need for a "puffer-pipe" low-speed control system. It did this by utilising three pairs of Rolls-Royce/MAN RB.145 turbojets (each 2,750 lb. thrust), with one pair mounted in the fuselage, forward of the others, which were carried in wingtip pods, giving triangulated lift forces.

The VJ 101C took off with its wingtip pods tilted vertically so that all six engines were utilised fully for vertical lift. At a safe height, the pilot swung the wingtip pods slowly down, until the forward speed built up sufficiently for the fixed wings to supply all the necessary lift for cruising flight. The fuselage engines were then switched off, and the VJ 101C cruised conventionally, with the wingtip pods in a fully-horizontal position.

The first VJ 101C proved capable of forward speeds of up to Mach 1.08 before it crashed after a horizontal take-off in September, 1964. It was followed by the VJ 101C-X2, in which the wingtip pods were fitted with afterburning RB.145's to make possible speeds well above Mach 1. From it was supposed to be evolved the more advanced VJ 101D, with fueslage-mounted lift-jets and a conventional fuselage-mounted propulsion engine in place of the wingtip pods; but official support for this

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The Franco-German Transall C-160 military transport. Designed and built as joint programme for Luftwaffe and Armée de l'Air.

was withdrawn and EWR-Süd is now working, with technical assistance from its U.S. partner Boeing, on a more advanced design to meet a *Luftwaffe* requirement for a strike fighter for the 'seventies. The current design study is believed to feature a "swing-wing", but the cost of developing such an aircraft makes its progression from paper to ironmongery about as dubious as that of its projected Anglo-French counterpart.

Hamburger Flugzeugbau (HFB), having participated in the Noratlas transport programme, is now involved with VFW and Nord-Aviation of France in the joint development and production of the Noratlas' successor, the Transall C-160. This is a major commitment, involving the manufacture of three prototypes and six pre-production models, all of which have been delivered, and a total of 160 production aircraft, of which 110 will go to the *Luftwaffe* and 50 to the French Air Force. Components are built and assembled by all three partners, under the overall control of VFW, with production deliveries scheduled to begin next year.

The Transall C-160 is a useful medium transport, powered by two internationally-produced 6,100 s.h.p. Rolls-Royce Tyne turboprops and with a maximum payload of 81 troops, 62 stretchers or 35,270 lb. of freight or vehicles, loaded via a rear ramp. Range is 1,070 miles with a full load, and take-off run about 600 yards. The Transall is, therefore, a little smaller than the four-engined Lockheed C-130 Hercules in terms of payload, but with rather better short-field capability. There are those who believe it would have been a better proposition for the R.A.F. than the C-130, but at the moment Britain seems no more interested in buying German than Germany has been interested in buying British, even when the alternatives have been clearly inferior.

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HFB is also linked with VFW in ERNO and, hence, in development of the ELDO launch vehicle third stage. It designed and built the rear fuselage of the Do 31E and is a partner of the Dutch Fokker company in the design, development and construction of the forthcoming Fokker Fellowship twin-turbofan airliner. On its own, it has designed and put into production the little HFB 320 Hansa business-jet, notable for having sweptforward wings. The object of this is to enable the spars to pass through the fuselage aft of the passenger cabin, leaving an unobstructed interior and giving a better downward field of view for passengers. After a temporary setback, caused by the loss of the original prototype in May, 1965, production is now under way with completion of the first 20 aircraft scheduled for early 1967.

The Hansa enters a market in which it will have to contend with stiff competition from aircraft like the American Lear Jet, British HS 125 and French Fan Jet Falcon; but its performance is good, with a top speed of 509 m.p.h. and range of 825 miles when carrying a full load of nine passengers. Furthermore, the German government has helped by ordering an unspecified number for the *Luftwaffe*, which will use them as VIP transports and for flight testing military equipment.

HFB has about 4,500 employees. Messerschmitt is somewhat smaller today, with 3,800, but has its finger in an equally large number of pies. Major contracts involve production of wing centre-sections for the Transall, in co-operation with Siebel, and manufacture of UH-1D assemblies under subcontract from Dornier. As already noted, it is a member of the IGLR and EWR-Süd consortia. In addition, it has a 27% interest in Hispano-Aviacion of Spain and operates Junkers Flugzeug- und Motorenwerke as a wholly-owned subsidiary, mainly on electronics work.

The link with Hispano is interesting, as Prof. Willy Messerschmitt settled in Spain after the war and designed the HA-100 and HA-200 trainers for Hispano. A third design, the HA-300 delta-wing fighter, was transferred subsequently to the Helwan Air Works in Egypt, where it is under development as a potential Mach 2 fighter.

A brief reference has been made already to the 95/150 h.p. Pützer Elster two-seat light aircraft, one of several sporting machines and helicopters being produced in modest numbers by smaller members of the German aircraft industry. The only light aircraft of original design under development by a major company is Siebel's SIAT 223, also mentioned earlier as the winner of the 1962 contest for a standardised club trainer. It is an orthodox all-metal two/four-seater, with a Lycoming engine of 160 or 200 h.p., but Siebel seem more likely to make money from their subcontract work on Breguet Atlantic, Transall and Hansa aircraft than from the 223. They have 2,500 employees and, as well as being members of the IGLR, own 26% of the shares of Messerschmitt AG.

Last of the big companies is VFW and, in many respects, it is the most interesting. While earning its keep as a leading participant in the Transall, Do 31, Fellowship and (through ERNO) European space vehicle programmes, and by building two high-altitude meteorological research aircraft for the DVL, it has two important projects of its own under way.

With government backing, and with the assistance of Fokker, it is developing a

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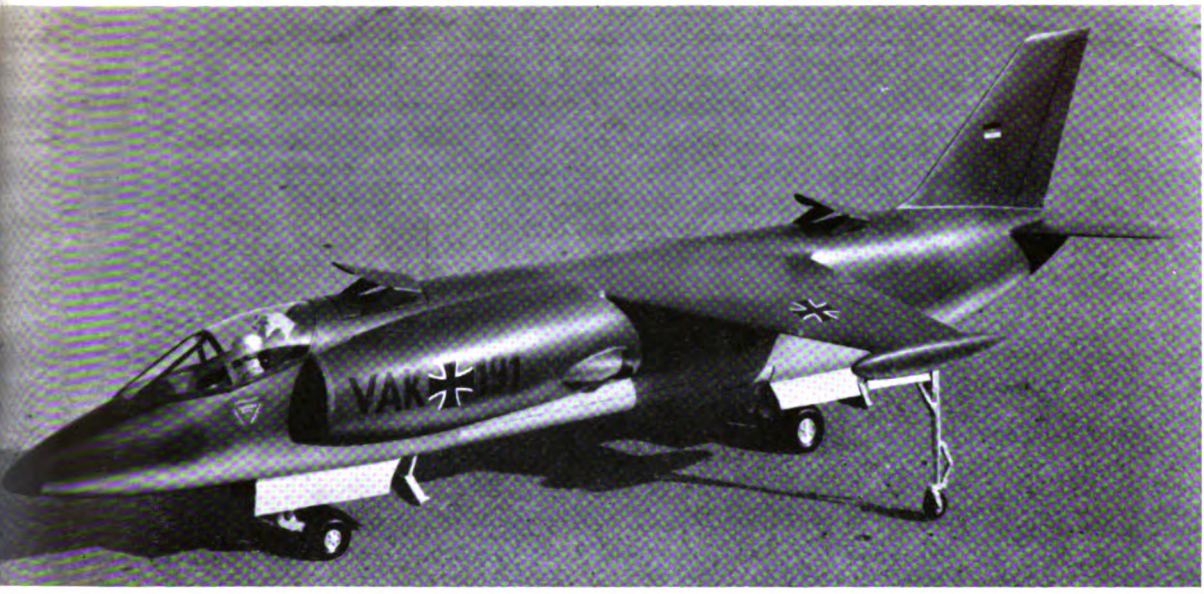

VFU VAK 191B, JOINT VTOL FIGHTER PROJECT
V.F.W. are building these 2 seaters; Fiat of Italy the single seater version.
Rolls-Royce/MAN lift and propulsion engines.
(*V.F.W. Photo*)

36-passenger twin-turbofan short-haul transport known as the VFW 614. Layout of this aircraft is conventional except in two respects. Its nose will hinge sideways for straight-in loading of freight and vehicles. More revolutionary still is that two 7,700 lb. thrust Bristol Siddeley/SNECMA turbofans will be mounted in pods *above* the slightly-swept wings. With full load the VFW 614 will operate from 4,000 ft. runways and will cruise at 457 m.p.h.

The other original VFW project represents, perhaps, the most important national programme currently under development in Germany, for the VAK 191B V/STOL tactical reconnaissance-fighter is the most advanced fighter under development in the world, following cancellation of Britain's P.1154. The power plant consists of a Rolls-Royce/MAN RB.193 turbofan with vectored-thrust nozzles for both lift and propulsion, supplemented by a pair of vertically-mounted Rolls-Royce RB.162 lift-jets fore and aft of the main engine.

The VAK 191B is no paper project. Three two-seat prototypes are being built by VFW and three single-seaters by Fiat of Italy, with the first flight scheduled for 1968.

More than anything else, this potentially world-beating fighter symbolises the re-birth of the German aircraft industry phoenix-like from the ashes that remained after World War II.

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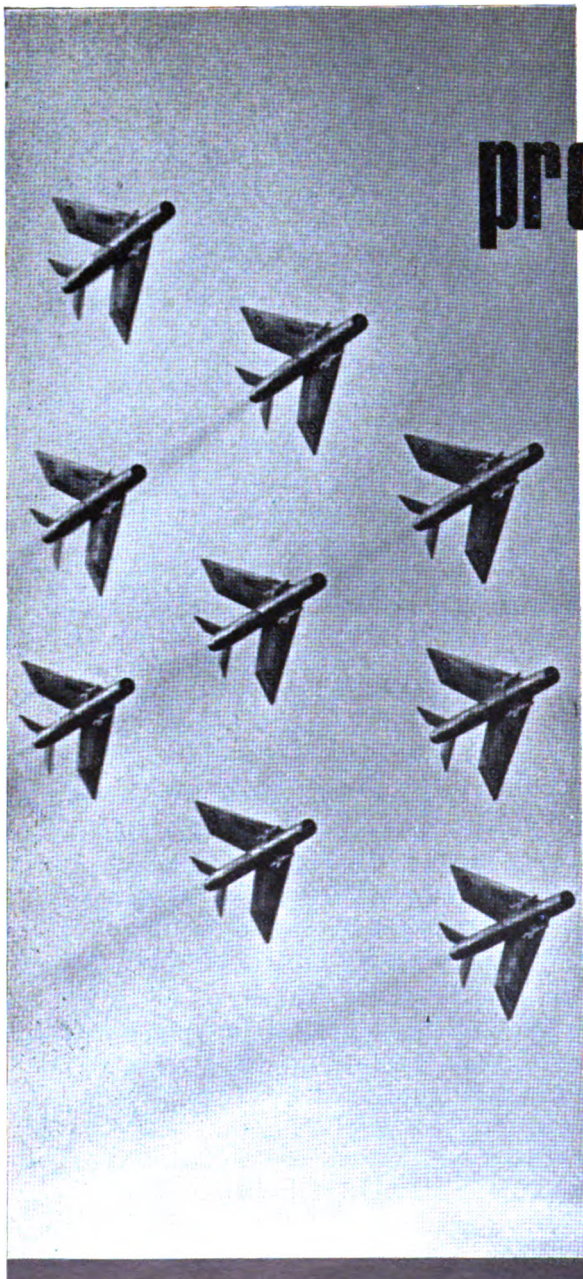

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The Risks of Trust

By Dr. C. L. Wayper, M.A., Ph.D.

THREE great political figures of modern times, Gladstone, Woodrow Wilson and Nehru, have dedicated themselves to the removal from the world of what men call power politics. The lack of success that attended upon all of them has not, however, removed the danger that, dazzled by the splendour of the objective sought, we may be blind to the totality of the failure to achieve it. It is important, therefore, to examine the most recent of these three attempts "to introduce civilised behaviour in international affairs" and to ask certain questions concerning it.

In endless exhortations and marathons of moralising Nehru addressed himself to that task. He who once said that the world would be a better place if foreign secretaries said less about foreign affairs spoke so constantly about them that it seems clear that he looked upon himself as more of a missionary than a foreign secretary —as Trygve Lie found him, when after the Chinese occupation of Tibet his mind was engrossed with Korea and Formosa to the utter exclusion of considerations of his northern frontier. His was the task of educating the world into salvation. In no "barren neutrality or passivity" but only in intense international activity could that task be discharged.

He had no doubt about what men and states must do to be saved. They must get away from ideas of balance of power, "the impotence of which as a basis of international policy stands proven," and of cognate "19th century notions which have no meaning to day," such as that of the buffer-state. They must avoid entangling alliances which bring only the illusion and not the reality of security, and which are "completely out of place" because "the U.N. is the beginning of the world structure" for which all must work, and "the more groups and blocs are formed the weaker will the structure become". They must pluck hatred from the heart, for "when eyes are bloodshot vision is limited" and only by ridding themselves of it can they "promote the temper of peace" in which they must approach all their differences. They must cast out fear, "an ignoble emotion that leads to blind strife," and learn that "there is nothing really to fear except fear itself." They must "take the risks of trust," trusting in the goodness of others and believing with Gandhi that "trust begets trust." They must promote "a climate of peace" by signing 'No War' declarations. They must eschew force, which "does not belong to this age and is not dictated by reason." They must rely not on guns but on the moral sanction and on world opinion, "a force strong enough not to tolerate wrong." And all this was summed up in the simplest of catechisms, the famous Panch Sheel or Five Principles — respect for territorial integrity and sovereignty, non-aggression, non-interference in each other's internal affairs, equality and mutual benefit, peaceful co-existence—principles which would ensure that "there would hardly be any conflict and certainly no war."

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But it was not only confidence in the force of his preaching that sustained Nehru in his conviction that he could save the world, though he left no pulpit unthumped. Neither Gladstone nor Wilson had been lacking in loquacity or in the power of the word, and yet they had failed. Nehru, however, believed that he would succeed because there was a part of the world, great and destined to be still greater, which already practiced what he was preaching. This was Asia which was "essentially peaceful," and which could give the example which the West, locked in hatred and violence, could not give, the example of States replacing "the politics of power by the politics of brotherhood" and so benefitting from so doing that men who could not be taught by precept alone would eagerly desire to emulate them. Asia's "soothing light" would thus bring to all men a peace that the West had never been able to enjoy.

Can Nehru himself claim to have consistently modelled his actions on these views? To this first question, which any consideration of them must prompt, the answer is clearly 'no'. Like his master Gandhi before him, who was ready to meet the Japanese with force but who had urged the British in 1940 to greet the Germans with love, he was more virtuous when the interests of others were at stake than when those which he himself held dear were in jeopardy. No doubt with him as with Gandhi it was only with the greatest reluctance that he made concession to vice, but the reluctance is less important than the yielding for that denies the proposition that he had anything of value to teach men in the conduct of their international relations. We can understand how Portugal's attitude that she was ready for talks about Goa, but only on the basis that Goa was and would remain Portugese, would infuriate India and drive her to action which she had not wished to take, and notice that this did not help Nehru to understand how Pakistan would be similarly infuriated and similarly driven to undesired action when India maintained that she was ready for talks about Kashmir so long as it was agreed that Kashmir was and would remain India's. We can appreciate his reluctance to call China an aggressor in Korea on the ground that if you want to negotiate with people you must not call them names, and observe that as a preliminary to negotiating with Pakistan over Kashmir he insisted that the U.N. dub the Pakistanis aggressors. We can be impressed by the inclusion in the Indian constitution of art. 51 according to which "the State should endeavour to encourage settlement of international disputes by arbitration," and be oppressed both by the fact that this had no relevance for Kashmir, which was neither a 'dispute' not a 'justiciable' issue, and by the further fact that the morality of holding the plebiscite to which Nehru had agreed in Kashmir failed to prevail against the certainty that he would lose it if he did. We can see the difference between his condemnation of military bases in foreign territory and his possession of them in Sikhim and his desire to have them in Bhutan. Above all we are compelled to note that his clear understanding that if force were used against Goa "we give up the whole roots of all our policies and our behaviour" did not prevent its employment. And in all this it is of no importance that Nehru appears as something of a hypocrite for a touch of hypocrisy is something that makes the whole world kin. What is of importance is that long before the Chinese reminded him in 1962 that he had been "out of touch with reality," he had demonstrated the fallacy of his premise that Asia was immune from power politics, had shown that

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states, be they liberal, Christian or even Asian, do not act as he had imagined they did, and that those to whom their destinies were entrusted would always have to make those same compromises with reality to which, however reluctantly, he himself had been driven.

Was the world a better place because Nehru advanced these views? The answer to this second question that we must ask is equally clearly 'no'. It is true that, while he was putting them forward, a great part of the world did indeed become better than it had been for a long time. That was, however, in spite of and not because of his views. The emergence of balanced power and its consolidation in nuclear deadlock made the Great Power world safer and more stable than it had been for many years. Yet these were the things which India rejected, though of course she benefitted from them. Moreover that part of the world, sufficiently extensive in area, which could not be improved by the emergence of balanced power and nuclear deadlock was not improved either by Nehru's exhortations. It remained unimproved, as on the Himalayas he found to his cost, as in S.E. Asia we did to ours.

Was the world a worse place than it need have been because Nehru was attracted to these ideas? To this third question the Chinese attack in 1962 suggests that the answer is 'yes'. If he had not been so concerned with other people's affairs he might have bothered more about his own. If he had not been so engrossed with a danger which, had it ever existed in the degree to which he thought it did, he could never have done much about—the danger of world war—he might have been more aware of the flames beginning to crackle in his own backyard. If he had not said so loudly that he would rather India be reduced to dust than give up non-alignment China might have had a little more consideration for his interests. If he had not been fascinated by such vague and meaningless platitudes as the Panch Sheel, decked as they were in all the imprecision of masterly indefinition, he might not have been satisfied, as he had to tell Parliament that he had been, to receive from China for a period of 10 years answers to protests concerning frontier violations which he said were "simply not good enough." Fear and foresight are not synonyms, but if he had had more of the one he might have had more of the other, might have realised that more effort would have to be made to cope with those problems, such as Kashmir, which it left unsolved might make it impossible to prepare adequately to meet the new situation created by China's action, might even have wondered whether world opinion was really as strong as he had pretended. Taking the risks of trust in the confidence that they would be negligible he had to accept the consequences when they were not.

It is not the least part of his legacy that Indians who have been sharply reminded that they must now trust less than they did have now also to run risks greater than they need have done. And this was always inevitable for his message, like Gladstone's and Wilson's, was one not of truth but of illusion. There are no paths out of the jungle but only tracks within it and the alternative to familiarising ourselves with them is returning to the trees from which, only a day or so ago, we swung protestingly down.

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FLEET AIR ARM STORY

By Commander J. M. Palmer

(Editor of *"The Navy"*)

IT is just 55 years since the Fleet Air Arm was born when, in the spring of 1911, three naval officers, Lieutenants Samson, Gregory and Longmore, and one Royal Marine, Captain Gerrard, turned up at the Aero Club's aerodrome at Eastchurch to learn to fly the two Short 'pusher' biplanes which had been offered, on loan, free of charge, by Mr. Frank McClean to the Admiralty. Instruction, too, was to be given free by Mr. G. B. Cockburn.

Having mastered these primitive craft, and persuaded the Admiralty to buy them the pilots next sought to adapt them to naval use. Longmore, in conjuction with the Short brothers, concentrated on producing a seaplane, first by fitting airbags on which the aircraft were able to alight, and finally, in March, 1912, Short devised the first float-plane able both to take off from and alight on water. Samson addressed himself to another problem—that of flying off from a deck and had a platform erected over the forecastle of H.M.S. *Africa* from which he first took off in December, 1911.

The Army had meanwhile been developing its own aviation with aeroplanes and small non-rigid airships for reconnaissance. The smell of wasteful duplication reached the suspicious nostrils of the Treasury with the result that in April, 1912, the Royal Flying Corps was constituted, consisting of an Army Wing, a Naval Wing and a Central Flying School. This was never treated very seriously by the Admiralty who continued to administer a Royal Naval Air Service, the *de facto* existence of which was finally recognised in July, 1914, when the R.F.C. (Naval Wing) vanished without trace. The Admiralty, however, continued to bear the responsibility for the development of airships and for Home Air Defence which had been given to it on the formation of the Royal Flying Corps.

As a result of the former, the Submarine Scout airship or 'Blimp' was developed, more than 50 being in use by the end of the 1914 - 18 war, deployed at a number of stations round the coast. Home Air Defence remained an Admiralty responsibility during the first two years of the war and led to the formation of a number of R.N.A.S. fighter squadrons, the majority of which were eventually deployed alongside the R.F.C. on the Western Front where they built up a great fighting record.

One requirement of Home Air Defence being the destruction of the enemy's airships, the R.N.A.S. also initiated strategic bombing with raids on the Zeppelin bases in the Ruhr, in Belgium and as far afield as Friedrichshaven on Lake Constance.

The first sea-borne air strike was mounted on Christmas Day, 1914, when Short seaplanes from the seaplane carriers *Empress, Engadine* and *Riviera* took off from the water of the Heligoland Bight and bombed the dockyard at Cuxhaven. During the Gallipoli campaign, Flight Lieutenant Edmonds, flying a Short seaplane, made history by delivering the first successful air-borne torpedo attack, sinking a Turkish transport in the Dardanelles.

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Nevertheless, seaplanes were soon found to have their limitations, particularly in home waters where the weather was seldom calm enough for them to operate from the open sea. A deck from which they could fly off was a partial solution and this was provided in April, 1916, when the ex-Cunarder *Campania* joined the fleet with a flying-off deck from which seaplanes on jettisonable trolleys took off. The requirement for fighters with the fleet led to rotatable platforms being erected on board cruisers from which Sopwith 'Pups' could take off and, in August, 1917, the 'Pup' from the *Yarmouth*, flown by Sub Lieutenant Smart, shot down a Zeppelin into the sea. Following this success, platforms were also erected on the gun turrets of battle cruisers from which 'Pups', '1½Strutters' and, later, 'Camels', took off.

Other steps were taken to give the fleet its own air component. In July, 1917, the cruiser *Furious* joined with a forward flying deck 228 feet long from which 'Pups' took off. All these aircraft had either to reach an airfield ashore or to 'ditch' alongside a ship on completion of their mission. A deck on which they could also land was an obvious requirement. The possibility of using the *Furious's* fore deck challenged the skill of her pilots. By flying up the ship's length from aft and side-slipping inwards on passing the bridge superstructure, Flight Lieutenant Dunning succeeded in doing so. This could only be looked on as a stunt, however, and, indeed, on his second attempt, Dunning's aircraft went over the side and he was drowned. It was then decided to give the *Furious* an after deck also; but, as forecast by her captain, in spite of a simple form of arrester gear, the turbulence over it was so great that few successful landings were ever achieved. For the rest of the war the *Furious* operated with only her flying off deck from which in 1918, six 'Camels' took off and successfully destroyed the Zeppelin base at Tondern and the two air-ships in their sheds.

It was not until early 1918 that a deck on which aircraft could land was provided when the *Argus*, converted into a flush-deck carrier from the liner *Conte Rosso*, came to sea, carrying 15 aircraft among which were some of the first ship-borne torpedo planes, the 'Cuckoos' designed by Tom Sopwith. An attack on the German fleet in harbour, proposed by the C-in-C, Grand Fleet, Admiral Beatty, was vetoed by the Admiralty, thereby preventing an event which could not have been other than of tremendous influence on the development of naval aviation.

On 1st April, 1918, the R.N.A.S. and the R.F.C. were amalgamated. The Navy's air component became the Fleet Air Arm of the newly-constituted Royal Air Force. When the 'War to End Wars' came to an end, bringing massive reductions in the armed forces, it is not surprising that the infant service concentrated its efforts and available funds upon preserving a bomber and fighter force at the expense of an ancillary force for the Navy. The Fleet Air Arm fell upon hard times. Lacking support from its parent service, its performance failed to impress a Navy in which very few officers with any knowledge of aviation remained.

Just enough aircraft were provided to equip the six carriers which joined the fleet between 1918 and 1928. Their types were retained in service far beyond obsolescence. When replacements finally emerged, they were usually adaptations of types developed for shore service and lacked essential characteristics of carrier aircraft. Air Council

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FAIREY "FLYCATCHER" OF THE FLEET AIR ARM: CIRCA 1926

(Ministry of Defence Photo)

opposition to specialisation of General Duties officers led to constant changes of air crews, each requiring deck-landing training at the beginning of a cruise. Just as they were becoming useful naval aviators, they were apt to be posted away.

Inevitably the Admiralty agitated for restoration of control into its own hands. Equally inevitably, fearing any divisive threat to its independence, the Air Council resisted. Nevertheless, little by little, the Air Council's position was eroded. In 1921, naval officers took over observers' duties. Two years later it was decreed that a maximum of 70% of the pilots should be naval officers. It was not, however, until the belated re-armament programme began in 1936 that the lamentable state of naval aviation was fully exposed. The new carrier *Ark Royal* had been laid down on the lapse of the Washington Treaty. Four more carriers of the *Illustrious* class were projected. With the Air Ministry more and more pre-occupied with its own re-armament programme, little attention could be spared by them for naval aviation. No modern aircraft for the new carriers were being produced. Problems of training and manning were mounting.

On the recommendation of Sir Thomas Inskip, Minister for Co-ordination of Defence, the Cabinet therefore decided in July, 1937, that the whole of the manning, organisation and control of the Fleet Air Arm should be transferred to the Navy. Development and supply of all aircraft however, remained an Air Ministry responsibility.

In the short time available before the outbreak of war, little could be done to make good the deficiencies in naval aviation and, whatever the reason, it has to be said that the Fleet Air Arm went to war woefully ill-equipped. The two principal types

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of aircraft were the open-cockpit, fixed undercarriage biplane, the Swordfish, as the Navy's torpedo-reconnaissance aircraft, and the monoplane Skua, which attempted to combine the incompatible roles of fighter and dive-bomber. The former aircraft, and its closed-cockpit version, the Albacore, lingered on until confrontation with the Japanese carrier force off Ceylon in 1942 finally exposed its inadequacy and led to the acquisition of American Avengers as replacements. The requirement for a higher-performance fighter soon relegated the Skuas, but not before two squadrons of them had made history by achieving the first sinking of a major war vessel by air attack when the *Königsberg* was sent to the bottom of Bergen harbour in April, 1940.

The Swordfish established its fame — or rather that of the crews who flew it into the attack at its stately 80 knots — when it stopped the *Bismarck* in the nick of time after surface ships had conspicuously failed to do so, and when it crippled the Italian battle fleet at Taranto in November, 1940. The Albacores' most important contribution was perhaps their achievements in collaboration with the Desert Air Force when they provided illumination for the bombing operations which did so much to bring about the defeat of Rommel.

Efforts to improve the quality of the Fleet Air Arm's aircraft resulted firstly in the replacement of the Skua by the two-seater Fairey Fulmar fighter in which, in spite of its comparatively poor performance, prodigies of valour were performed in defence of the Malta convoys. As a combined torpedo plane and glide bomber, the much derided Barracuda was produced, an aircraft which found few friends. Nevertheless it was with this type, flown from the *Victorious, Furious* and three escort carriers, that the Fleet Air Arm succeeded in putting the battleship *Tirpitz*, newly repaired after a midget submarine attack six months before, out of action again. For the loss of two Barracudas, 14 bomb hits were scored.

The Spitfire, adapted for carrier operation as the Seafire, gave the Fleet Air Arm its first high performance fighter with which air cover was supplied from escort carriers during the North African landings and at Salerno until the Air Force could be established ashore. For oceanic operations, however, the Seafire lacked the robustness necessary for deck work and the endurance to accompany strike aircraft on their missions. It was not until American types were acquired, the Avenger, mentioned above, and the Hellcat and Corsair fighters, that our carrier force was able to operate in concert with the U.S. Pacific Fleet in the war against Japan.

By the end of the war, the Fleet Air Arm had hauled itself at last out of the 'String-bag' era and had achieved an efficiency second to none. Since then, in spite of financial restrictions, ageing carriers and aircraft, it has maintained that efficiency; by inventing the angled deck, the steam catapult and the mirror landing sight, indeed, it has led the way in introducing the most important advances in carrier operation.

Its days as a fixed-wing force are now numbered. There is sorrow amongst those who have watched it grow up from infancy. Yet it may well be that the phasing out of the aircraft carrier from our fleet will be found to coincide with the phasing out of the fixed-wing aircraft itself, offensively and defensively, with the advance in efficiency of ground to air missile.

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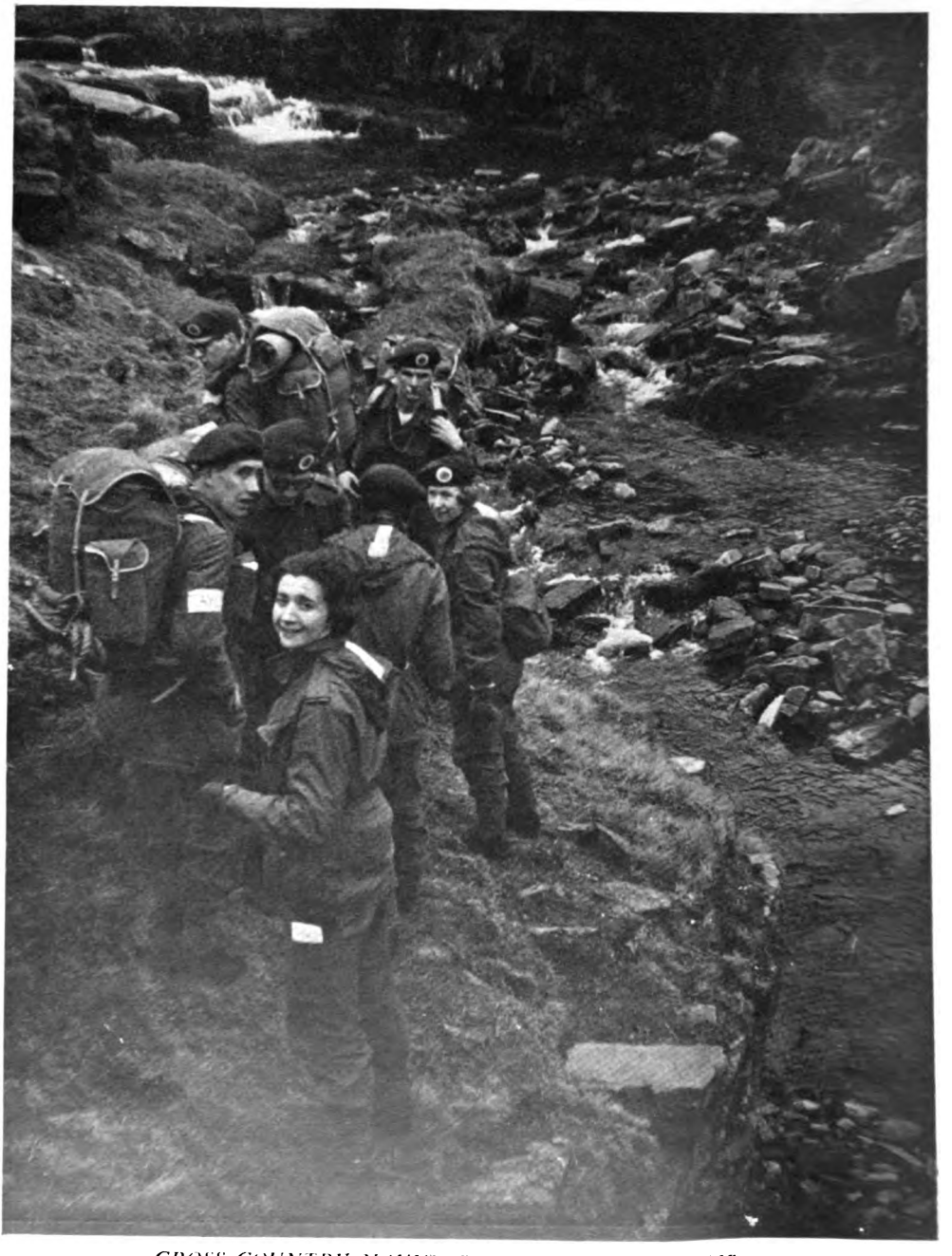

CROSS COUNTRY NAVIGATION BRECON BEACONS
A W.R.A.F. flight commander and R.A.F. and W.R.A.F. cadets of Officer Cadet Training Unit, Henlow.

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OFFICER CADET TRAINING UNIT, HENLOW

By Group Captain N. F. Curtis, o.b.e.

Historical Background

LORD TRENCHARD, in his concept of the Royal Air Force, visualised that an officer's primary task would be flying and that associated technical and ground duties would be his secondary task. This was the origin of the General Duties Branch. Some engineering posts were filled by G.D. Officers who after five years flying were trained for technical specialisation at Henlow: others were trained at Cambridge University, while Signals and Armament specialists were trained at Electrical and Wireless School, Cranwell, and the Armament School, Eastchurch, respectively. Only a small number of ground specialist officers, mainly accountants and equipment officers, were recruited between the wars. Their officer training was provided by a short course at R.A.F. Uxbridge.

The advent of World War II necessitated a major change in the organisation of the R.A.F. G.D. Officers were urgently required to fill command and flying appointments and their administrative and technical tasks had to be taken over by increasing numbers of non-flying personnel. At the same time rapid advance of technology brought about a need for the formation of a separate Technical Branch.

The original ground branch officer training school at Uxbridge became inadequate at the beginning of the war to cope with the increased number of entrants. A second school was opened therefore at Cosford where eventually all ground branch officers were trained. The school at Cosford continued as the R.A.F. Officer Cadet Training Unit until 1948 when it was transferred to Spitalgate. The expansion of officer training with National Service necessitated the formation in 1952 of a second O.C.T.U. at Millom, and in 1953 this unit moved to Jurby on the Isle of Man. The Spitalgate O.C.T.U. closed in 1954. In 1962 the W.R.A.F. O.C.T.U., which had been at Hawkinge since 1947, amalgamated with the R.A.F. O.C.T.U., and in 1963 the new combined O.C.T.U. moved to Feltwell in Norfolk.

In the meantime R.A.F. Henlow had expanded and had become the R.A.F. Technical College. In 1959, however, a working party was commissioned to study requirements for the long term development of the R.A.F. Technical College, Henlow. The committee felt that the Henlow site did not justify the large sum of money that would be required for its further development and recommended that a new Technical College should be provided at Cranwell alongside the existing college. This would provide the R.A.F. with a potential unversity, and permit training up to degree level in some cases.

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Members of No. 190, O.T.C. attending a Dining-In Night with the Directing Staff in the Officers Mess, R.A.F. Henlow.

(R.A.F. Henlow, Photo)

In 1965 when the necessary building programme was complete the Technical College moved to Cranwell to become part of the R.A.F. College. This left vacant the post war Officer Cadet mess and comprehensive instructional accommodation and in 1966 R.A.F. O.C.T.U. moved from Feltwell to Henlow. Thus commenced a new era linking the history of the Officer Cadet Training Unit with R.A.F. Henlow, and on the 26th August, 1966, the first graduation parade took place. It was appropriate that the Reviewing Officer, Air Vice-Marshal E. M. T. Howell, C.B.E., F.R.Ae.S. (S.A.S.O. H.Q. Technical Training Command) was the last A.O.C. of the Technical College.

Officer Training Establishments

The R.A.F. now has three officer training establishments: the R.A.F. College, Cranwell, the R.A.F. Initial Training School at South Cerney, and the R.A.F. O.C.T.U., Henlow. Candidates for all are selected at the Officer and Aircrew Selection Centre at Biggin Hill. All go through the same basic selection system except that the candidates for flying training have additional flying aptitude tests. Those candidates who have the necessary educational qualifications for entry to university go to the R.A.F. College. Cranwell. There they receive an education comparable with that of

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a university. At the same time they are trained as pilots or navigators for the General Duties Branch, as engineers for the Engineer Branch, or as administrative officers for the Secretarial Branch or Supply officers for the Equipment Branch. An even larger number of young men enter the Initial Training School at South Cerney to begin their training as pilots or navigators. At the end of the course they receive their commissions in the General Duties Branch and are then posted to flying training units for training to wings standard.

The O.C.T.U. at Henlow trains almost 60% of the R.A.F.'s annual requirement of new officers. Its commitment includes R.A.F. and W.R.A.F. officers for all ground branches. It also includes airmen aircrew who are to be commissioned in the G.D. Branch. Unlike the R.A.F. College and I.T.S., the O.C.T.U. does not combine specialist professional training with officer training. It provides only the basic training common to all R.A.F. and W.R.A.F. officers. On successful completion of the course newly commissioned officers undergo specialised professional training at other units before taking up their first appointments.

Role of O.C.T.U.

The O.C.T.U. Course is designed to prepare candidates for their general responsibilities as officers. The Course lays emphasis upon Leadership and Discipline, Organisation and Administration, Customs and Etiquette of the Service, Air Force Law, Physical Training and N.B.C. Warfare. The course provides an adequate background knowledge of the present structure and history of the R.A.F., the role of the W.R.A.F., welfare and the organisation of games and sports. It also introduces a cadet to Public Speaking and Committee work, service writing and office organisation, the Maintenance of non-public accounts and Elementary equipment procedures. The Charter which defines the role of the O.C.T.U. also states that though not part of the selection procedure the O.C.T.U. is to initiate appropriate recommendations in respect of candidates whose performance on the course fails to confirm their suitability for commissioned rank.

Types of O.C.T.U. Courses

Four types of courses are provided by the O.C.T.U.

a. A one-month course is given to newly commissioned entrants to the Medical, Dental and Chaplains Branches and to re-entrant officers. Such students attend the course as officers.

b. A two week course is given to officers of Princess Mary's Royal Air Force Nursing Service.

c. An Officers' Preliminary Course, of two months' duration, is provided for young men and women direct from civil life, who are between the ages of 17½ and 22 years of age and who have no civilian professional qualifications. This course is designed to help the young direct entrants to bridge the gap between civilian and service experience, and to prepare them for entry to the main O.C.T.U. course.

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d. The main O.C.T.U. course is the Officers' Initial Course, which lasts four months. It receives the young men and women from the Officers' Preliminary Course and entrants direct from civilian life, from within the service and from Commonwealth Air Forces. The direct entrants from civilian life have reached the age of 22 or have civilian professional qualifications: they include graduates, teachers, engineers, members of professional institutions, master mariners and individuals from a wide range of civil occupations. Service entrants vary in rank from aircraftman to warrant officer, in age from 21 to 45, and represent most trade groups. Both men and women with this wide range of experience and age receive the same training.

O.C.T.U. Organisation

The O.C.T.U. is responsible to H.Q. Technical Training Command through H.Q. No. 22 Gp, for its training and administrative efficiency. The O.C.T.U. has a Group Captain Commandant, who is also the Officer Commanding R.A.F. Henlow. There are two wings, Training Wing and Administrative Wing. The Administrative Wing also provides support for several lodger units including the Radio Engineering Unit of Signals Command. The Training Wing is commanded by the Chief Instructor who is a Wing Commander. His staff consists of a Senior Education Officer, a Senior Ground Defence Officer, a Senior W.R.A.F. Training Officer and Training Control section. There are five training squadrons: Blue, Green, Red and Yellow Squadrons which are responsible for the Officers' Initial Courses, and Black Squadron which is responsible for the other three types of courses. The squadron commanders may be from any branch of the service.

The Officers' Initial Course

A new Officers' Initial Course begins each month. It is formed into a squadron of six flights, five R.A.F. flights each under a flight lieutenant, and one W.R.A.F. flight under a flight officer. The flights contain 11 or 12 officer cadets each. The flight commanders, like the squadron commander may be of any branch. In addition, the squadron has an officer and an N.C.O. of the R.A.F. Regiment, an education officer, and a warrant officer. The squadron directing staff remain with the officer cadets throughout the course. In the four months a great deal of work is required for a commission.

The officer cadets are moulded into a unit. They are taught the basic drills and the men receive small arms training. They are taught how to make decisions and how to translate such decisions into orders. More than that, they learn self-discipline on which military service is based, where the individual must set aside his personal desires in order to live and act as a member of a team. Much of this learning process comes from the inter-action of the service entrants and the civilian entrants, each gaining much from the other. In their four months at the O.C.T.U. their life in company gradually makes them appreciate the unique comradeship of service life.

Leadership

It is a fact of R.A.F. organisation that most airmen and airwomen are commanded

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at flight and section level by junior officers of ground branches. The officer cadets are taught the principles of leadership, and training is designed to develop their potential leadership qualities. This training comes in part from the example shown by the flight commander and by other members of the directing staff. Mainly it comes from a series of leadership exercises. They are all out-of-doors and begin with flight exercises under the direction of the flight commander. They culminate in a week's camp under canvas in one of the Army's Practical Training areas in Norfolk, where the whole squadron lives and works entirely under the executive command of officer cadets. A cadet can be the Camp Commandant one day, wearing pseudo Squadron Leader badges of rank, and the next day an airman in the cookhouse. The directing staff, with the specialist advice of the R.A.F. Regiment Officer, devise the various exercise tasks. These leadership exercises are not feats of endurance but they embody elements of stress and discomfort. While they give each individual the chance to practice the art of leadership and to improve physical fitness, they also provide him with the opportunity to recognise his own and other people's limitations and capabilities under varying circumstances.

Management

Whether they are on main bases or primitive forward airstrips, junior ground branch officers are concerned with most of the day-to-day management at unit level. The officer cadets must therefore absorb a considerable knowledge and 'know-how' of the management techniques of the Service. Initial training in such techniques is given in the classroom by specialist officers but it soon moves on to practical indoor exercises and case studies. Some of it is done in the training theatre with demonstrations by flight commanders, followed by role-playing by the cadets. In its final stages the training becomes as near as possible to realism in an officer simulator building. There, in a net-work of offices and communications, the flight and then the whole squadron, participate in large scale situation exercises in wihch the work of the entire station is simulated. In parallel, with their management training the officer cadets are taught and practice oral and written communication techniques under the direction of the education officers.

The Role of the R.A.F.

Although the terms of service of officer cadets passing through the O.C.T.U. vary considerably, it is essential that their professional careers should be based on a deep understanding of their Service's role in the world. They begin their study with R.A.F. History, looking at the Service at critical periods in its past. They move on then to the R.A.F. in world affairs today, in its theatres of responsibility and from there on to future trends in defence policy. This study is not done just by formal lectures. Under the direction of the education officers officer cadets engage in project work and collective presentations on the R.A.F. role. They take part in discussion with experienced officers of the directing staff and they are exposed to the views of officers from the other two services. They also have lectures from civilian authorities such as university lecturers and defence correspondents. In this way it is hoped to lay a foundation of loyalty and pride of service, and an informed appreciation of the R.A.F.'s role in national defence policy.

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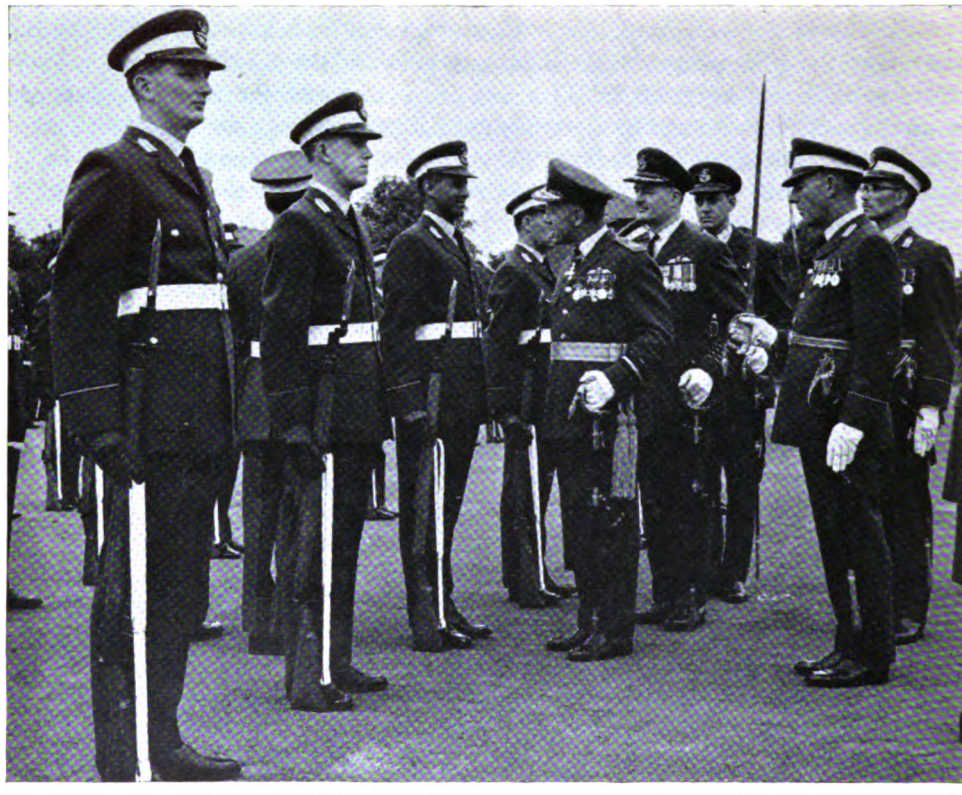

GRADUATION PARADE No. 189 O.T.C. 26/8/66
Air Vice-Marshal E. M. T. Howell (Reviewing Officer), followed by Group Captain R. F. Harman (then Commandant).
(Ministry of Defence Photo)

Officer Qualities

The most important part of the officer cadet's training is the most difficult to define. It is the fostering of those qualities which make a man or woman worthy to hold the Queen's commission and make them trustworthy guardians of the standards and traditions of the R.A.F. This aspect of training cannot be given by formal instruction or even by practical exercises. It is a process of acquisition which depends largely on the example and guidance of the individual flight commander. It is a consideration which must pervade every other aspect of training. From their first day at the O.C.T.U. the officer cadets live in officers' mess accommodation. They are the occupants of what must be one the finest messes in the R.A.F., and they are responsible for the conduct and running of the mess. It is significant to see the profound effect this has on their attitudes and behaviour. It is the influencing of their attitudes that is the real task of the flight commanders.

Tradition

Due attention is paid to ceremonial at the O.C.T.U. The monthly Passing-Out Parade is reviewed by an Air Officer and is a source of pride to the officer cadets,

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to the directing staff, and to the relations and friends of the graduating squadron. During the parade the Reviewing Officer presents a Sword of Merit to the most outstanding R.A.F. officer cadet. This sword was once the personal sword of Air Chief Marshal Sir Leslie Hollinghurst, who first presented it at the graduation of No. 1 Officers' Initial Course at Millom in 1952. Next year will see it presented on the 200th occasion when No. 200 O.I.C. graduates from the O.C.T.U. The Reviewing Officer also presents to the best W.R.A.F. officer cadet a Sash of Merit which was inaugurated nearly 20 years ago at Hawkinge.

Standards and the Future

Of course, not all officer cadets become officers. The Officers' Initial Course at the O.C.T.U. is a 'pass/fail' course. The R.A.F. has stringent standards for its officers and it is the O.C.T.U.'s duty to see that the officers it commissions measure up to those standards. A comprehensive system of assessment and testing is followed throughout the course and if at any stage an individual does not attain the requisite standard he will be recoursed for additional training or it will be recommended that he be withdrawn from the O.C.T.U.

The O.C.T.U.'s system of training is not static. Changes are being made continually to the syllabus as a result of experience, end-of-course critiques and changes in the Service. The directing staff are constantly seeking improvements in their training methods and a great deal of experiments are tried, based on lessons learnt within the O.C.T.U. or from visits to the other officer training units of the three armed services and comparable civilian establishments. The O.C.T.U. aims to provide officers of the right standard, equipped with a basic training, who will serve the R.A.F. well, and will uphold the motto of the O.C.T.U., 'Majora Tento'—'I strive for greater things.'

THE R.A.F. QUARTERLY AND OFFICERS CAREERS

It is hoped that those responsible for the training of junior officers will draw their attention to the fact that each number of "THE ROYAL AIR FORCES QUARTERLY" contains articles helpful to them in their preparation for Promotion and Staff College Examinations.

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PEACETIME SOLDIERING

By Air Vice-Marshal W. Carter, C.B., D.F.C., R.A.F.

DURING the last war it was popular to quote regular Army officers as saying, "The sooner this little struggle is over, the better; then we can get back to some real soldiering". Whether this is a fair quote does not greatly matter. The point is that service in the forces prior to World War II undoubtedly offered a brand of 'soldiering' which was an extremely attractive way of life. It offered a wide variety of travel, sport and social activity, and all these were liberally spiced with touches of active operations. On the north-west frontier of India, for example, the succession of clashes between unruly tribesmen and our own forces were such a permanent feature of life that they injected a hardening and adventurous factor into what might otherwise have tended to become a pretty soft existence. Similarly in Iraq air operations in the northern mountains were nicely balanced off by games of polo and cricket once crews got back to base. This was all very much an accepted pattern of things. It was fun, it was not humdrum like spending one's life on an office stool and, set in the context of British overseas policy at the time, it was a job worthwhile.

Unfortunately, as so often happens after the major upheavals of this world, things were never quite the same again. Looking back we can now see that there never was a true cut-off point in terms of struggle and uncertainty when World War II was officially declared closed. The series of turbulent events in such places as Korea, Malaya, Palestine and Kenya, to name but a very few, appear now as a jumble of operations which have formed the serious pattern rather than the exciting highlight of Service life. No one would deny that there are still attractions in serving overseas but the whole environment in which we live and work, dictated as it is by the sombre hand of financial stringency and close political control, has now lost a great deal of its former lightheartedness.

All this was true of Palestine immediately following World War II when the deep inherent bitterness between Arab and Jew came into full spate. The story of the three years' fighting, terrorism and civil unrest which preceded the setting up of Israel as an independent state, and with it the withdrawal of British forces, is well known. It needs no elaboration here other than to say that for those of all three Services who were stationed in Palestine during this period there were few of the old attractions of peacetime soldiering. However we did try, as the not too serious account which follows may show.

Between 1945 and 1948 Jerusalem was hardly a happy city. For the British serviceman life was a series of restrictions, curfews and bomb explosions. Some of the latter appeared as muffled rumblings from the innards of the Old City, others might blow your window in. Also, there was something quite foreign to the British character in having always to move around in fours, even off duty, and in having the irritation of

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a pistol or revolver constantly flapping from the waistband. And even things like cricket lost some of their appeal when teams had to play under armed surveillance. To get away from Jerusalem was therefore a welcome relief. One way of doing this was to get to the Azraq marshes in Jordan and spend forty-eight hours or so shooting duck. This was not straightforward or easy since Azraq lay several hours' journey into the Jordan desert east of Amman and so the mere fact of getting there at all involved setting up a minor expedition. Such an expedition, requiring as it did a couple of Jeeps or similar vehicles, immediately had a military and therefore suspicious look about it. Thus before it ever started out from Jerusalem it was pretty certain that it would sooner or later become cannon-fodder for somebody; and that either on the outward journey or the return (or both) there would be something of what the French so delightfully describe as an 'histoire'.

On the particular day in question five of us set out; four aspiring duck hunters and Brown. Brown was something of a key man in the whole affair. He was a lance-corporal, the driver of our Army Liaison Officer whom we numbered among the party, and his job was more or less to guard us, guide us and feed us. He was to prove not inadequate in all three roles. With our two vehicles piled high with kit and supplies we left Jerusalem and followed the Dead Sea road down to Jericho. We talked very little, for there was a nasty feeling among us (though we all hated to say so) that something was bound to happen. The road was overhung by rocks and it seemed that there must be a sniper behind each one; or alternatively that wherever the dusty road looked more than usually pock-marked, there must be a mine or booby-trap. In fact, nothing happened and so our 'Jerusalem nerves' provided us with something of an anti-climax. Nonetheless, a chatter of relief broke out as we crossed the Jordan and climbed the winding road up through Es Salt and into Amman. Here we made a brief stop at the local R.A.F. station for last minute supplies and then drove on up the Zerka road before branching out eastwards into the barren desert.

The Jordanians were normally most friendly and helpful but at this particular time some of the rancour from Palestine had found its way into their country. Even so, we were slightly surprised when a party of them gathered round our Jeeps as we pulled up at a road block near the Arab Legion camp at Zerka. At first all was jabber and it was difficult to decipher what precisely it was about us that was worrying them so much. Eventually however it became evident that one of our party was giving offence because he was wearing one of those white peaked 'baseball' caps formerly affected by members of the German armed forces. A similar type of cap was common wear among the Palestine Jews. It was clear, and the crowd was gathering all the time, that we were heavily suspect. Then, our offending member had a bright idea. He was wearing (though we could not quite see why) his old R.A.F. rugby shirt, with its crown and albatross badge, under his bush jacket; and it was obviously a most unlikely Jew who could have taken the field at Twickenham in an inter-Service match. Moreover, from our attempted description in Arabic of how the game of rugby is played, it finally became clear even to the most bigotted Jordanian that no Jewish terrorist would be likely to have wasted his time on such a complication.

There were handshakes and 'Mah salamis' all round and we were off again. The

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desert track was parched dry and as we bumped along over its uneven surface we set up clouds of dust which penetrated everywhere; and we finally arrived at Azraq looking like some of those little white men on the TV advertisements who pop in and out of bags of finely sifted flour.

The Arab Legion had loaned us their empty hut on the edge of the marshes and our first task was to get ready for the evening flight, whilst Brown busied himself with the administrative side of the operation. Our dress was scarcely that of the duck hunter as seen in the smarter sporting magazines but it was highly practical for coping with the treacly mixture of mud and sand which formed the bed of the marsh. We eschewed waders or gum boots and instead took to drill trousers, tucked into old stockings, with equally old tennis shoes on our feet. Then, though the water was bitterly cold the first time in, we were able to manoeuvre with certainty among the weeds and rushes.

Before this first evening flight we decided to walk up a rough bog for snipe and it was here that we met Old Joe. He was a very old marsh Arab, tanned almost black by the sun and salt wind, and he was remarkable if only for a coincidence about him. This was that a nasty jagged hole in the left-hand barrel of his ancient fowling piece matched up with a missing right eye. When he loosed off at anything, from a snipe to a marsh heron, the whole countryside reverberated and we feared for his other eye. But as he pointed out, this eye and his remaining sound barrel were on opposite sides and therefore Allah's will would have to be tortuously unkind if the one should be removed by the other. It was a simple man's philosophy and he accepted it happily, as indeed he appeared to accept walking the bog from dawn till dusk.

We got two or three snipe and were lucky to get these, what with Old Joe's blunderbuss frightening everything within mile. Then we waded out into the marshes to wait for the duck coming in. Joe wandered off home and left us to it. Small boys from the tiny local village had tagged themselves on to us, one apiece, almost without our noticing it; and with the quick darkness came the duck winging in from the open water to the bog behind us. We added a half dozen or so of them to our snipe and reckoned we had had a goodish preliminary outing.

The searching cold of the desert night numbed our legs and feet as we drove back to the hut and there Brown had bowls of steaming water and tumblers of rum waiting for us. Dry socks and shoes, the first tingling effects of the salt wind on our faces, and the rum, combined to give us a wonderful sense of well being; and we felt like kings as Brown dished up bully beef curry, piping hot, on tin plates. The wind of the marsh sang round the hut but our battered old stove glowed red in defiance. We cleaned our guns for the morrow and sat yarning before wriggling down into our sleeping bags. These are some of the real moments in life, moments when men are at peace with themselves, their friends and the world.

The alarm clock rattled us into life at 3 a.m. and we pulled on heavy sweaters before we nosed our way quietly by Jeep round the edge of the marshes. The water, we knew, would be like ice and we hesitated for a moment before plunging in for the long wade across the end of the snipe bog. Finally, in a long spread-out line, we waited for the first sounds of the stirring duck. They began to sound like a squadron

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of war time aircrew assembling for a bomber briefing. The first ones would start chattering among themselves and then the volume of sound would grow as others joined in, until there was the very babel of the crew room. Then quite suddenly, there would be complete silence. It was as if the squadron commander had come and shouted, "Shut up, you chaps, otherwise you won't hear what the target is".

The silence was our cue to loosen our chilled shoulders, to check safety catches and to peer into the lifting gloom. One or two wise birds reaped the reward of being early, slipped past us with a whishing of swift flight and made for the open water. Then there came the first barrel, startling the marsh into life, and the ensuing splash told us that it had found its mark. We had a most rewarding stand and laden with our spoils found it hard going back to the Jeep. By now the sun had turned the marsh from grey, through a spectrum of blue, into yellow dawn. We paused for a smoke and surveyed the bag; several teal and mallard, a couple of pintail and a shoveller. Azraq was full of duck at this time of the year. It lies on one of the big migratory routes and all species seem to use it as a main staging post.

We did the snipe bog over for good measure and then went back to Brown and breakfast. Our appetites were enormous and Brown did them proud. It was still only about eight o'clock and the plan for the day was to go back to the marsh and work independently. Brown was left with one of the Jeeps and a .22 rifle and instructions to amuse himself whilst we were away. Then at about four in the afternoon we would return to the hut before setting out for the evening flight.

The day shoot was perhaps the best of the lot. The sun was now warm and drove away the chill of standing thigh deep in water among the scrubby trees. Sometimes a convenient hole in the sand dunes made a comfortable hide in which to sit quietly and wait, gun between knees. A pintail came over very high. He got a left and a right but merely shook himself and looked round as if making a note to avoid in future that particular two-barrel anti-aircraft position.

The marshes, like the surrounding desert, were vast and silent. The sun and salt whipped ruddiness into our faces. And above all, it was peaceful.

We foregathered at the hut around four o'clock and set about Brown's hunky sandwiches with gusto. He too had had a good day with his .22. He had discovered that coot are as stupid as they look and had bagged several, though he was disappointed to learn that they make high eating which gives even the practised gourmet to think twice.

The weariness in our legs disappeared with the evening's wading and by the time blackness again cloaked the marshes, we had added substantially to our bag. Brown's curry and rum rounded it off; and tired and burnt of face, we called it a day.

We shot again over Sunday and took Monday's morning flight but then had to drag ourselves away. The Jeeps were well laden with an assortment of duck and snipe and protested at some of the rougher going on the way back. We chattered gaily over the enjoyment of the past three days and wondered when we might see Azraq again. But we had not yet finished with this trip, for ahead we spotted sand

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grouse. Guns were hastily produced and we had an hour or so's superb sport before finally setting our noses toward Amman.

Once over the Palestine side of the Jordan we lost some of our gaiety, for Jerusalem was now a depressing place to which to return. On the last lap from Jericho one of our Jeeps broke down and it was voted that two of us would remain with it whilst the others went on to send out an armoured car to tow us back. The night was on us quickly and the road was deserted. We had our revolvers but nonetheless felt that we were a pretty vulnerable target, immobilised as we were. Eventually however we heard the armoured car rumbling down the hill towards us and found it commanded by a very forthright Yorkshire sergeant of the R.A.F. Regiment. His language was inflammable.

"The so-an-so Arabs are at it now," he told us. "Got a road block across the road at the top".

We asked him if he thought it would be alright for us to go on, feeling that he had the advantage of his armour whereas we in our Jeep were pretty exposed.

"O' course it'll bloody well be a'reet," he said. "I'll bloody well show 'em if it isn't".

He soon had us in tow and as we approached the top of the hill just outside Jerusalem, shouted back to us, "They're just up 'ere the daft 'apporths".

At that moment we heard shouts from either side of the road telling us to halt. We fingered our revolvers, determined to have a go if the worst should happen.

But the sergeant had no illusions about who was in command of the situation.

"You bloody daft lot come out," he ordered. "And move these bloody barrels. And get a move on, an' all. Who the hell do you think you are, playing at bandits like a lot o' kids".

His Yorkshire accent cut into the shadows of the olive trees. Six sheepish-looking fellows emerged and quickly dismantled the offending obstacle. The sergeant drove on shouting, "An' don't let me catch you up to this sort of caper again. Or I'll show you what we're made of up in Yorkshire".

Behind him in our Jeep we chuckled. We could hear him cursing to himself above the rattle of his vehicle. No doubt his ideas of peacetime soldiering were pretty explosive but there was little doubt that, like us, there were times when he thoroughly enjoyed it.

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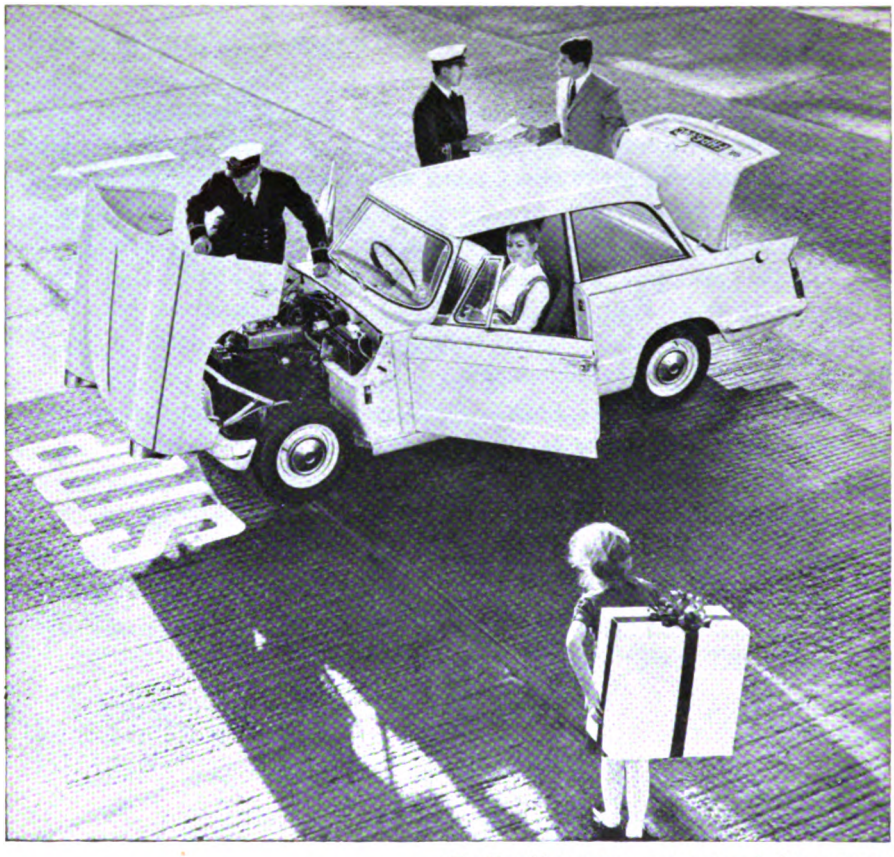

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TRIUMPH

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SHIFTS IN RUSSIA'S STRATEGIC POSTURE

By Wing Commander J. F. L. Long, M.A., R.A.F. (Retd.)

Two years after Khrushchev's downfall, military specialists in the West are still divided in their estimates of the intentions of his successors in the field of military strategy. The article below, which was written on the eve of Exercise Vltava, the biggest Warsaw Pact joint operation to date, discusses some significant trends in Soviet Strategic thinking that, in the author's view, need to be taken into account in any reassessment of Soviet intentions today.

IF the critics of Mr. McNamara were complaining earlier this year rather loudly that he keeps his options open long past the time when decisions should be taken, with how much greater force might a similar charge be levelled at Marshal Malinovsky and his aides in the U.S.S.R. Defence Ministry. In a sense, they have not been dragging their feet since Khrushchev's downfall applying some of the lessons learnt from the failure of the quest for an inexpensive, all-purpose strategy based upon a largely static rocket force. But they have not been moving fast enough for some influential military men in Russia and, as yet, do not appear to have come up with a coherent military doctrine.(1)

This may, of course, be impossible at the present time if the rumours are true of the existence of "Hawk" and "Dove" factions inside the Politburo. Nevertheless, the revised doctrine, when it finally crystallizes, will have to take into account certain facts. One of these is President Johnson's conviction that Russian strategy, whether based on missiles or subversion, has been effectively checked; this must be shown to be palpably false. Another is the need to disprove once and for all Chinese charges that the attempt to harness Soviet military power to the service of politics was nuclear fetishism. Moreover, in the present somewhat overheated international atmosphere, soft words from Russia's political leaders about the need for communist states, including the U.S.S.R., to concentrate upon building up their economic strength can hardly have contributed to lessening the obvious concern of Russia's military leaders at the persistence of negative or defeatist attitudes to nuclear war among officers and men or dispel their natural distaste for strategies of mutual deterrence that lack a definite war-winning capability. The prospect of national suicide, if deterrence failed, appeals no more strongly to the Russian military than it does to national leaders in the West.

Experts Disagree

Military specialists inside and outside government service both here and in America differ widely in their assessments of the direction in which Russian strategic thinking appears to be moving and some argue that there has been no perceptible indication

(1) For previous discussions in these pages on this and allied topics, see "Soviet Military Doctrine under the New Leadership," *Quarterly*, Summer 1965; "USSR Long-Range Aircraft," *Quarterly*, Winter 1965; "Soviet Army and Navy Day, 1966," *Quarterly*, Summer 1966.

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of direction at all. There is still no general disposition in these circles to react to the significant hints coming out of Moscow about the probable scale of its military research and development programme. So far these appear to have been treated seriously only in certain congressional circles and by the U.S. Joint Chiefs of Staff (which is often a good enough reason for private strategists to dismiss them). But among recent portents that the case of the Joint Chiefs may be worth a second hearing are, first, a handful of meaningful remarks made recently on public occasions and in print by important figures in the Russian military hierarchy and, second, Kosygin's admission that the publication of the 1966 - 70 Plan—already eight months late—has been postponed yet again.

The suggestion that this postponement was due to a showdown in the Politburo just before the August session of the U.S.S.R. Supreme Soviet between the so-called Kosygin "Doves" (said to favour keeping to the economic guidelines laid down at the 23rd C.P.S.U. Congress) and the Brezhnev "Hawks" (said to be demanding larger allocations for defence) does not hold water. The suggestion is based on the assumption that the decision of President Johnson to sanction the bombing of targets in the Hanoi and Haiphong area brought about the split. This seems most unlikely, not least because this particular contingency was not difficult to foresee and must have been the subject of debate in the Soviet Politburo much earlier in the year. A much more probable reason (though it must be frankly admitted it is difficult to document) is the continuing disagreement about the future structure of the Russian economy. It does not require an especially close knowledge of the cross-currents in the discussion about resource allocations since the C.P.S.U. Central Committee plenum took its momentous decision to subsidize Soviet agriculture on a massive scale in March, 1965, to pin point the crucial issue today as the claims of defence for a greater share of investment to sustain radically new research and development programmes for military hardware of an extremely sophisticated kind in the 70s and early 80s.

The Crux of the Politburo's Problem

In a nutshell, then, while there is probably a large measure of agreement in the Politburo about the defence gaps that still need to be plugged as a direct result of abandoning Khrushchev's all-purpose strategy, there may not be a consensus of view yet, or in prospect, on the shape of a strategy for the 70s and beyond. Much as Brezhnev and Kosygin have shown themselves able, unlike their predecessor, to communicate with the military they may, all the same, feel reluctant or unable for political reasons to follow military arguments to their logical conclusions. This is, of course, a difficulty which all political adminstrations face from time to time, not simply the Soviet. And it is possible that for the present political leaders in the U.S.S.R. the achievement of a rough sort of parity of military force with the U.S.A. is considered far more important than assessing precisely survival prospects in a long or short nuclear war, or finding a formula for the right mix of strategic missile and combined operations forces, or deciding whether these forces must be capable of simply war waging or of war winning. This is not to say that they are not interested in these questions, but that they may not be the most topical questions, in their view.

A particularly interesting reflection of the sort of pressures which the political

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leaders are probably under at the moment can be seen most plainly in an article which appeared in a recent issue of the twice-monthly journal of the main political administration of the Soviet armed forces by two of Khrushchev's most bitter critics on questions of strategy.(2) The writers are the aging but forceful former Chief of the General Staff, Marshal Sokolovsky, and his close collaborator on many occasions recently, Major-General Cherednichenko.(3) For reasons that are still far from clear, this article has evoked little comment among observers of the Soviet scene in the West despite its obvious importance. Some have even dismissed it as being of little interest.

The self-appointed task of the two authors is to present a vigorous case for bringing Russia's military potential up to the same degree of combat readiness as that of the U.S.A. and its N.A.T.O. allies, whose balanced forces, they assert, even in peacetime, are deployed in the right places and in the right numbers for the achievement "of their chief war tasks in a short period." Sokolovsky and Cherednichenko seem to subscribe somewhat half-heartedly to the official Warsaw Pact view that the "steady preparation" of the socialist countries for responding to an imperialist attack is a "dependable deterrent factor" (as they put it) and appear far from convinced that the U.S.S.R. is really in a position to withstand the first nuclear blow, retaliate and *win*.

Pre-emptive Possibilities

Of special interest is their forthright endorsement of the standpoint of the strategic missile lobby that Russia's primary objective in a nuclear war is threefold — of destroying (1) the economic strength of the enemy; (2) his system of government and administration; and (3) his armed forces.(4) Also of interest is their opinion that, even though a general war might be a long one (as they have pleaded in the past it might be), the contingency that one side would seek to obliterate the other in the shortest possible time had to be planned for. Russia's armed forces, they argue, had to be ready from now on to deal with a hypothetical space-air surpise attack by the U.S.A. which had as its aim the defeat of the U.S.S.R. in the very first moments of the war.

The official view, first elaborated by Marshal Malinovsky at the 22nd C.P.S.U Congress in 1961, is that the Russian armed forces possess the capability of breaking up an attack of this sort, but there has always been considerable doubt among official and private strategists about whether this implied that pre-emption actually figured in Soviet calculations.(5) The view among middle-of-the-road military commentators in America has been that this ambiguous position has been adopted purposely to create uncertainty about Russia's intentions and thereby heighten the credibility of its deterrent posture.(6)

Sokolovsky and Cherednichenko now make it clear beyond doubt that the Russian response should *either* be a nuclear counter-attack *or* a pre-emptive blow, if the cal-

(2) *Kommunist Vooruzhennykh Sil*, No. 7, 1966, pp. 59 - 66, "On Modern Military Strategy."

(3) For previous references to the views of these two authors, see "Soviet Policy and the Role of the Military," *Quarterly*, Winter 1964; "Soviet Military Doctrine under the New Leadership," *Quarterly*, Summer 1965.

(4) It may be accidental, but the *order* of the enumeration is the reverse of that given in both the first and second, corrected, edition of *Military Strategy*, prepared under the editorship of Marshal Sokolovsky, and tallies exactly with that favoured by Marshal Krylov, Commander-inChief of the Soviet Strategic Missile Forces.

(5) See, for instance, Raymond L. Gartoff's *Soviet Military Policy* (Praeger, 1966), pp. 192 - 193.

(6) See Thomas W. Wolfe's *Soviet Strategy at the Crossroads* (Havard, 1964), pp. 64 - 67, and also Horelick and Rush's *Strategic Power and Soviet Foreign Policy* (Chicago University Press, 1965 - 66), p. 91.

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culation is that this would confer a significant advantage in what is graphically described as the "segment of time" between the initiation of a nuclear war and the execution of "fundamental military-political and strategic tasks." That this is their view is confirmed incidentally by the authors' own admission that, while the *possibilities* of launching a surprise attack continued to increase, so also had the opportunities for "detecting not only the start of an assault *but also the start of the enemy's preparations for an assault—this is, of being able to prevent surprise attack.*"

However, if the enemy's nuclear missiles have left their launching pads (Sokolovsky and Cherednichenko say), a nuclear counter-strike had to be mounted in the "segment of time" available before the incoming missiles reached their targets, with the aim, first, of frustrating the attack and, then, of achieving the U.S.S.R.'s primary objective described above. They are confident that "the result of a response of this kind *could be* destruction of so high an order that the enemy would be prevented from continuing." But Sokolovsky and Cherednichenko are careful to stress that Soviet strategists had yet to solve the problem of precisely what had to be done in this crucial initial period. Further, the general war tasks of the land, sea and airborne forces and of the anti-aircraft (P.V.O.) and anti-missile (P.R.O.) forces[7] had to be defined exactly.

At first sight it may appear strange that the two authors do not outline any solutions of their own or discuss such questions as the role of the M.R.B.M. - I.R.B.M. forces in holding Europe "hostage" or even justify their implicit endorsement of a general war strategy that assumes massive destruction at the outset when all the signs are that military thinking in the U.S.S.R. has begun to move in the direction of a flexible response strategy.[8]

However, their purpose is none of these things, but, it seems, attention on the important point that *there can be no meaningful discussion at General Staff level* of the shape of a war-winning strategy or the appropriate degree of readiness needed *unless* the shortcomings of the existing strategic planning system, which is in the hands of men in or nearing their 70s, are eliminated. The inference is that the present system is hidebound, inadequately staffed and incapable of responding with lightning speed to a swiftly changing situation.

Soviet Strategic Research Criticized

Sokolovsky and Cherednichenko commend, for instance, the U.S. Joint Chiefs of Staff system for the efficiency with which it fashions and refines military plans and strongly favour the way in which opinions of an "army of scientists," solutions presented by sophisticated computers, and lessons learnt on manoeuvres are used to

(7) It may be important, in the light of certain indications that the U.S.S.R. is beginning the deployment of some kind of anti-missile force, that the abbreviation P.R.O. is bracketed for the first time to the present writer's knowledge in an article on a military theme with the more familiar P.V.O. However, the bracketing does not seem to be consistently done.

(8) The main evidence of this remains the scheme of last year's Warsaw Pact exercise October Storm, now supplemented by the variant exercise that took place in September this year under the name Vltava. It is possibly not without considerable significance that this year one of the main aspects of the exercise was the speed with which the Pact forces could react to an incursion from the West—on this occasion an incursion that relied upon air transport to land part of the attacking force on the other side of the river Vltava and upon the use of nuclear weapons in the opening phase of the attack. It will not escape notice that one of the main complaints of Sokolovsky and Cherednichenko is that the speed with which Soviet forces might react (and by implications *all* Warsaw Pact forces) falls short of what is needed and to this extent the scheme of the Vltava exercise may have been shaped to answer criticisms of this sort.

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"check" these plans *regularly*. Why, they appear to be asking, is there no "factory of military thought" in the U.S.S.R. like the RAND Corporation, no Hermann Kahn or no equivalent of the British Institute for Strategic Studies? Without the participation of specialists with the appropriate knowledge in wide-ranging discussions on the most urgent problems, the field of strategic research could not be broadened nor the present limitations of Soviet military science eliminated.

Apart from one slashing attack in July this year in the U.S.S.R. Defence Ministry's daily *Krasnaya Zvezda* on the "gangsterlike" activities of RAND, Hermann Kahn and the British Institute, the reaction of the military leadership has so far been to ignore the broadside. The right inference to be drawn from this is that there exists a large measure of agreement among the ageing marshals for its main recommendations, which does not run counter to their own feeling that they cannot reasonably be accused of dilatoriness in sweeping away the worst features of Khrushchev's nuclear fetishism, hastening the diversification of Russia's nuclear forces (now deemed to be "adequate" in "kill" capacity) and proceeding with the build-up of combined operations forces.

Increasing Importance of the Soviet Navy

Sooner or later it must be expected that a coherent doctrine must emerge. For the moment, the signs are of adjustment. One of these, which seems to have passed virtually unnoticed on both sides of the Atlantic, can be seen in the steady upgrading of Soviet naval power in the past two years. Most eloquent testimony to this came in the striking emphasis that was laid in the Navy Day propaganda at the end of July on Russia's newly acquired stature as a "great naval power" and on the end of the "complete domination of the seas by the traditional naval powers."

Despite hints from Washington that the U.S.S.R. has increased its rate of construction of nuclear submarines to 10 per annum,[9] no hard information has been forthcoming about the build-up of a Polaris-type missile fleet. This silence may be linked with the disagreements in the Politburo about resource allocations; indeed, that this *is* one of several expensive projects that have been preventing the finalization of the 1966-70 Plan. But the silence does lend indirect support to the thesis that, in the recent past, the Soviets have been concentrating their main efforts in the submarine field upon expanding the "N" type torpedo-attack fleet as an essential countermeasure to the U.S. Polaris force.

If this reading is correct, it would go some way towards explaining Marshal Malinovsky's cryptic announcement at the 23rd C.P.S.U. Congress in April last of the creation of a new defence system with the code name "Blue Belt." But suggestions made at the time in London and on the Continent favoured either an anti-aircraft or a land-based anti-missile system, while more recently the view has been advanced that the system includes the entire strategic (i.e., nuclear) posture of the Soviet Union. To judge by some remarks dropped by the G.D.R. Defence Minister at the end of May, and by more recent hints put out at the time of the Vltava exercise, "Blue Belt" is none of these things, but the name of the strategic missile submarine fleet itself.

(9) This figure would seem to be far too high and is not endorsed in the Institute for Strategic Studies' assessment *The Military Balance* 1966 - 1967 where the rate is stated to be "at least five a year" (p. 5).

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Advances in Military Communications and Control

According to Admiral Tolstolutsky, the Soviet Navy's chief of communications, a number of important advances have been made also in the particularly sensitive field of military and naval communications and control. The admiral may well have been anxious to promote the notion abroad that the Soviet Union's strategic forces, notably its submarines, can rely upon means of transmission that are both extremely swift *and* secure. He did not mince his words when he claimed that the "struggle to gain time had become a struggle for victory in combat." Absolute secrecy could be achieved only, as in the past, by absolute radio silence, he said, but modern methods of transmission (automatic encyphering combined with speed and accuracy) guaranteed the security of ship-to-shore communications and precluded (or so he claimed) the possibility of fixing by D/F the position of naval units. The U.S.S.R. has apparently found an answer to the vital question of maintaining uninterrupted contact with submarines at great depths, but, unlike the U.S.A., does not so far appear to have developed a world-wide control system. Though difficult to accept in the absence of further evidence, the admiral also seems to be suggesting that secure communications could also be maintained with troops in the field, tanks and aircraft.

A feature of exceptional interest in the propaganda treatment of Navy Day this year was the spotlight focussed on the Marine corps. Seen in the perspective of the modernization and re-equipment of the airborne forces, the search for staging posts in the Middle East and Africa and the reported employment recently of in-flight refuelling techniques for delivering short-range MiG 21 fighters via the Mediterranean to Egypt, this emphasis suggests not simply that the expansion of the Marine corps (thought to be about 3,000-strong) is now contemplated or is under way but also that a new stage has been reached without much fuss in the creation of a rudimentary long-range crisis capability. The lack of drama and the generally business-like way Khrushchev's successors have gone about their task should not shut our eyes to this important fact.

SECOND SUCCESS

For the second time Group Captain E. A. Johnston, O.B.E., has won the 50 guinea first prize in the Gordon Shephard Memorial Prize Essay Competition. Group Captain Johnston, who is Officer Commanding Military Air Traffic Operations (Southern Region) at R.A.F. Uxbridge, Middlesex, won the award in 1962. He has repeated his success this year with a 4,000-word essay on the following: — "Assume that the British Government will provide funds for the exploitation of space for one military and one civil project. Discuss space project priorities so far as Britain is concerned".

This essay will be published in the March, 1967, number of *The R.A.F. Quarterly*.

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Ret.)

PARLIAMENT adjourned for the Summer Recess "at ten minutes to Five o'clock" on Friday, 12th August, and will reassemble on Tuesday, 18th October, unless specially recalled earlier in an emergency.

During the last two weeks of the Session, several important matters were the subjects of questions and answers in the House of Commons; and a selection of these are summarised below.

Air Defence of Maritime Forces

In view of the decision, announced in last February's Defence Review, not to order any new aircraft carriers, the question of the air defence of maritime forces naturally arises. Mr. Godman Irvine asked the Secretary of State for Defence what aircraft would be used in the 1970's for that purpose, and what arrangements had been made to train the Royal Air Force for that role. Mr. Healey replied: "Phantom aircraft will be used for air defence in maritime operations in the 1970's, both before and after the task is transferred from the Royal Navy to the Royal Air Force. R.A.F. aircrews are already trained in air defence duties. In particular, the role will be covered in the training given to R.A.F. crews at the Phantom Operational Conversion Unit and in subsequent exercises and squadron training." In reply to a supplementary question, he added that all the necessary steps were being taken to ensure that adequately trained staffs would be available to direct these operations.

Anglo-Australian Base

Since we now have a somewhat precarious tenure of our base at Singapore, for the enjoyment of which we must depend upon the good will of an independent member of the Commonwealth, and taking into consideration our commitments to Australia and to S.E.A.T.O., for which we may need an alternative site for our base in the Far East, it is interesting to note that the Minister of Defence said in the House that discussions for a site in Australia were proceeding "at the official level" and that they were "exploring what facilities it would be possible to provide, at what cost, how soon and for what forces, should the need arise." "But," he added, "the need has not yet arisen."

Borneo and Brunei

Asked how many troops it was proposed to withdraw from Borneo and when they

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would be withdrawn, the Minister of Defence said, "About 10,000" and "as soon after the ratification of the Bangkok Agreement as Malaysian forces would be able to assume full responsibility for the defence of Eastern Malaysia (Sabah and Sarawak)." In reply to a further question on our continuing defence commitment to Brunei, he added, "Of course we recognise our commitment to Brunei."

East of Suez

Members of Parliament seem to be increasingly nervous about the honouring of our obligations in the Far East. On 3rd August, Mr. Christopher Mayhew asked the Secretary of State for Defence whether Her Majesty's Government were still taking account of the possibility of undertaking major military operations east of Suez in co-operation with the United States of America, otherwise than under United Nations auspices, and what arrangements he had made for the necessary co-ordination of resources. Mr. Healey replied that the possibility of such joint operations with the U.S.A. and other allies could not be excluded, but that specific arrangements for the co-ordination of resources were not required in current circumstances.

Mr. Emmanuel Shinwell then asked what re-organisation of British forces east of Suez was now proposed and to what extent that would affect the numbers engaged in that area. To which Mr. Healey replied that he could not yet go far beyond what had been said in the Defence Review last February. Our Forces would be withdrawn from Aden on independence, but there would be a slight increase in the strength of our forces in the Persian Gulf. Garrisons would be withdrawn from Southern Africa when the right time came. Our forces in the Far East would be reduced, as soon as circumstances permitted, to a size consistent with their remaining commitments. These measures, he concluded, would entail a very substantial reduction in the number of men now serving east of Suez, but it was still too soon to quantity that reduction.

In view of this last statement, it is comforting to read elsewhere that "preparations are being made to accommodate in the United Kingdom all those units from the Far East which will be brought back as a result of the Defence Review decisions." (*Written answer, 3 Aug. 66*)

Forces Pay (Prices and Incomes Policy)

On 10th August, Mr. Arthur Lewis asked the Minister of Defence to what extent the Government's wages and salaries standstill would apply to officers and other ranks in the Forces, and whether it would also apply to their annual and periodical increases. To this Mr. Mallalieu, on behalf of the Secretary of State, replied that of course the policy announced in Command 3073 applied to the Forces to the full extent. The White Paper stated that it was not intended to apply the standstill to the normal arrangements for increasing pay, either with age or by regular increments of specified amounts within a predetermined range or scale.

Joint Anti-submarine Training School

As readers will doubtless know, it is proposed to move the Joint Anti-submarine Training School from Londonderry to Plymouth in the not very distant future. The

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Member for Londonderry (Mr. Chichester-Clark) asked the Secretary of State for Defence what representations he had received to retain this establishment at Londonderry, and what action he would take. Mr. Mallalieu, speaking for Mr. Healey, said that he had been approached indirectly by the Prime Minister of Northern Ireland and pressed in the House by hon. Members opposite, besides having had a personal interview with Mr. Chichester-Clark. After renewed investigations and discussion, he had decided to move the school to Plymouth. Mr. Enoch Powell and Captain Orr both pressed for further consideration on strategic grounds and because of the employment situation in Northern Ireland. They also reminded the Minister that the experts whom he had consulted had given conflicting advice. But Mr. Mallalieu insisted that the school would have to be moved, adding that "experts frequently gave contrary advice and it is the job of the Minister to make up his mind."

Long-distance Maritime Warfare

Mr. Godman Irvine asked the Secretary of State for Defence what proposals he had made to change the name of the Royal Air Force in view of its new responsibilities for long-distance maritime warfare. Mr. Healey replied, "None, Sir." Mr. Irvine persisted. "As the strike/reconnaissance and maritime role will be very different from anything (so far) undertaken by Coastal Command," he said, "should not something be done to bring home, not only to the R.A.F. but also to the people of this country, the great increase in its responsibilities?" To this Mr. Healey replied with a well-merited compliment to the Navy, the Army and the Air Force. "The Services," he said, "are always dropping old responsibilities and taking up new ones. The people of this country fully appreciate the ability of our three Services to rise to this type of challenge."

Aircraft

Concord: In reply to a question concerning the potential hazards to crew and passengers in the Concord airliner during bursts of solar radiation, Mr. Mulley said that an airborne radiation detecting system had been developed which would warn the pilot of any increase in radiation intensity above the limits agreed by the Medical Research Council. This would enable him to reduce the height of the aircraft to an altitude where the radiation level would be acceptable. He also stated, in reply to another question, that experiments had shown that sonic bangs of the intensity expected to be caused by the Concord did not damage structurally sound buildings; and that there was no evidence so far that sonic bangs were injurious to health.

F.111: This aircraft has aroused much controversy and it has been suggested that our order be reduced or cancelled altogether owing to financial difficulties; but so far the purchase seems to be going ahead. Mr. Merlyn Rees stated, on 3rd August, that the first F.111 aircraft in the Royal Air Force would become operational early in 1969 and would be based in this country. Its role, he repeated, would be to replace the Canberra as a tactical strike/reconnaissance aircraft.

P.1127 and *Phantom*: In reply to a question on 3rd August, the Minister of Defence said that the Minister of Aviation was negotiating a contract with the manufacturers

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covering the development of, and a substantial production order for, the P.1127 aircraft; and they hoped that it would be in service in 1969. He denied that there had been any delay in the process of producing this aircraft. On 12th August, Mr. Healey said there had been no change in the plan to replace the Hunter by a combination of U.S. Phantoms and British P.1127's; and he added that two of our four existing aircraft carriers, H.M.S. *Ark Royal* and H.M.S. *Eagle*, were going to be modified to carry the Phantom. These modifications would be carried out during *Eagle's* refit, starting in 1970, and during *Ark Royal's* refit, starting at the end of this year.

Aircraft Noise

On 26th July, Mr. Hugh Jenkins was given leave (and ordered) to bring in a Bill to restrain nuisance by aircraft noise. This is timely action as the noise of aircraft, especially near busy airports, is increasing. How far it is injurious to health has not yet been ascertained; but it certainly affects the nervous system, which reacts on the physical.

Mr. Jenkins said: "One duty of Parliament, and an increasingly important one, is to see that the interests of the community as a whole are not over-ridden by technological advance. It is not for us to adapt ourselves to the machine, but to adapt the machine to ourselves. Scientists are over-fond of testing the limits of human tolerance to noise. They would be better advised to accept a limit well below the level of human tolerance and work to that . . . .

"The aim, however, must be not to prevent technological advance, but to forbid its more anti-social manifestations. More and more people will use jet aircraft . . . . and the matter cannot wait; because the development of supersonic aircraft, with sound-barrier and ear-drum breaking claps of noise beyond the loudest thunder, will bring this matter, which is already approaching the bounds of human tolerance, well beyond it.

"The community needs protection against itself . . . . International agreements will have to be reached, because the silencing of aircraft is not only a matter of scientific development but also one of economics and finance. It is already possible to reduce noise to a tolerable level at a cost in payload of about 5 per cent. One of the things which the Bill will do is to seek to reduce the permitted level of noise, which at present is 110 perceived noise decibels by day and 102 by night, to 100 immediately and then to 90 over a period of five years.

"These measures," he concluded, "are essential if we are to begin to tackle a problem which we must tackle if life is to remain tolerable or, in many areas, become tolerable for the thousands of people who live near airports in several parts of these small islands."

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Royal Air Force "Wessex" landing amongst 200 feet tall trees in jungle of ***East Malaysia.***
(Crown Copyright Photo)

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THIRTY YEARS OF CO-OPERATION

By Wing Commander A. G. T. James, O.B.E., R.A.F. (Ret.)

PUBLICITY accompanying publication of the 1966 Defence White Paper may have left in the lay mind an impression of bad inter-Service relations. It is time the record was set straight.

Thirty years ago, pilots of R.A.F. army co-operation squadrons flew Hawker Audax aircraft in support of the army on the North West Frontier of India. Recently, history has been repeating itself on North Borneo's frontier with Indonesia, where Hawker Hunter fighter-ground attack aircraft have been amongst those supporting the army in the jungle.

The Commonwealth's response to Indonesian confrontation in the Far East has been a complete inter-Service operation involving land forces—army and police—naval and air forces from the United Kingdom, Malaysia, Australia and New Zealand.

The ill-defined frontier dividing North Borneo and Sarawak from the Republic of Indonesia, stretches for nearly 1,000 miles across jungle covered mountains rising to 7,000 feet and impenetrable mangrove in the coastal areas. In the interior, the only "roads" are winding rivers, apart from which, for communication, troop movement, supply and reconnaissance, ground forces have been utterly dependent on the air.

In the final twenty-one months of confrontation fixed wing aircraft and helicopters carried some 30,000 tons of freight and nearly a quarter of a million men in 112,000 sorties involving nearly 37,000 flying hours. The task was carried out under exacting conditions, with few aids to navigation and over poorly mapped and mountainous jungle, using constricted landing grounds allowing little margin for error. Helicopter pilots (of all three Services) flew an average of eight hours per day, an increase of 50% on normal maximum monthly hours. Ninety per cent of loads dropped by the Beverleys and Argosys — usually on small DZs — were successfully retrieved. Particular credit is due to the ground crews who sustained these high operating rates in spite of living and working in jungle and tropical conditions.

We had flown from Lyneham to Singapore by R.A.F. Comet. From there a Hastings—the R.A.F.'s maid of all work—with much the same cruising speed as the war-time Halifax—carried us to Labuan island off the north west coast of Borneo. It was from this secure base, ceded to the British over 100 years ago by the Sultan of Brunei—that the Royal Navy during the last century operated successfully against pirates in the South China sea. Throughout confrontation, it provided the same security for Headquarters of the Director of Borneo Operations and the Air Commander and for one of the R.A.F. main forward airfields.

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From Labuan to Brunei our Twin Pioneer was piloted by two young Malay officers of the Royal Malaysian Air Force. On the airfield at Brunei were Beavers and Westland Scout helicopters of the Army Air Corps, supporting the Central Brigade. We continued our journey in the Twin-Pin over mountainous, unbroken jungle, diving down between cloud-capped, precipitous peaks to land on a short grass strip at Bario. When a British clergyman last made this journey—by boat and on foot—it had taken ten days. Our flight took 50 minutes.

Hardly had our aircraft come to rest at one end of the strip when parachute loads of supplies from a R.A.F. Beverley started landing at the other. As eager hands gathered up supplies, two army Sioux helicopters returned from reconnaissance and various Marks of Fleet Air Arm Wessex and R.A.F. Whirlwind helicopters prepared for troop-carrying supply sorties to forward companies. An R.A.F. officer controlled air traffic from a bamboo box at the top of four bamboo poles.

In the Officers mess, it was difficult to distinguish Army, Air Force, Navy and Marine pilots from each other. They all appeared to be wearing similar sorts of jungle green flying kit, doing a similar job and talking the same language.

Next, we flew in a R.M.A.F. Herald from Labuan on the west coast to Tawau, the other main R.A.F. forward airfield in Borneo, in the east. Our pilots now were R.A.F. officers "on loan" to the R.M.A.F. Storm warning radar enabled us to weave a comfortable way between crimson thunder clouds towering above us to 30,000 feet over the mountains.

Next day, a sergeant from R.E.M.E. doing a flying tour with the Army Air Corps, flew us in a Beaver to an air strip alongside a battalion headquarters on the edge of a rust coloured river deep in the jungle. From there we were flown by a young Malay officer in an Alouette helicopter to three company positions still deeper in the "Ulu" —as the soldiers call the jungle. This involved landing on bamboo helicopter platforms, in one case on a knife edge ridge, between 200 feet high trees. Our pilot had done his helicopter conversion in Paris, had a total of 400 hours (including fixed wing) to his credit and his performance in these unusual conditions was both competent and confident. An interesting experience for an aging aviator.

At first sight it might appear that, with all three Services in the flying business in the same operational area, there would be some overlapping of responsibility. In fact however, the flying role of each is clearly defined.

Not all the military equipment and supplies required in Borneo could come by air, so the Royal Navy's first task had been the traditional one of safeguarding the sea lanes of communication. In addition, the Royal Navy's little ships—mine-sweepers and frigates—had been fully stretched in denying some 1,300 miles of broken, largely deserted coast line to Indonesian infiltrators. The sea area is vast and naval air reconnaissance together with long range R.A.F. Shackletons, has been an essential part of patrol by ships. In addition, naval helicopters were put ashore from Commando carriers to re-inforce the R.A.F. in their close support of the Army.

From Labuan and Kuching airfields, Beverleys and Argosys have carried out continous supply dropping sorties. Navy Wessex helicopters and R.A.F. Whirlwinds and

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Belvederes have provided air lift for men and material where no landing strips were available in the forward area. Pioneers of the R.A.F. and R.M.A.F. and army Beavers have maintained communications where air strips were available sufficiently far forward.

Finally, in battalion and company areas, army units have employed Sioux helicopters to provide reconnaissance and spotting for guns and to enable brigade and battalion staffs to maintain physical contact with their units scattered thinly over 1,000 miles of jungle.

From the R.A.F.'s large, sophisticated bases on Singapore Island, Javelins have been sent forward to Kuching and Labuan to provide air defence patrols along the frontier. Hawker Hunter fighter-ground attack aircraft (from the same squadron which flew the Audax biplanes in an identical role in pre-war India) have trained regularly with army forward controllers. Canberra strike aircraft have gone into action against sizeable parties of Indonesians parachuted from the air into mainland Malaya. P.R. Canberras have photographed thousands of square miles of North Borneo and Sarawak to provide more accurate maps.

Finally, all concerned have been aware throughout confrontation of the powerful offensive potential of carrier borne strike aircraft and detachments of V-bombers at a high state of alert in the Far East. Their ever-ready presence has been a major factor in discouraging escalation of confrontation into war.

No one having visited this operational area—7,000 miles away from London—can have failed to be impressed by the high standard of inter-Service, inter-racial and inter-Commonwealth co-operation. It augers well for the future of the Services and Countries concerned.

No. 65 Squadron History

No. 65 Squadron celebrated its 50th Anniversary of formation on 1st August, 1966, and it is proposed to re-write the Squadron history. Any information from past members concerning the Squadron, its activities and other past members would be welcomed.

It would be appreciated if any correspondence could be addressed to: Flight Lieutenant P. Leathborough, No. 65 (SAM) Squadron, Royal Air Force Seletar, c/o G.P.O., Singapore 28.

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R.A.A.F. in Action

(Helicopters in Vietnam Battle)

By Squadron Leader W. Smither, D.F.C.

R.A.A.F. crewman attends wounded Vietcong prisoner during flight.
(R.A.A.F. Photo)

IT was for no idle reason that the commander of Delta Company, 6th Battalion, Royal Australian Regiment visited the R.A.A.F. base at Vung Tau, South Vietnam, recently. Major Harry Smith had come to say thank you to the R.A.A.F. chopper pilots of No. 9 Squadron for their action during an epic battle when Delta Company, outnumbered 8 to 1, defied the Vietcong.

R.A.A.F. helicopters, in response to a call for help from the Army, had battled through blinding rain during the height of the battle in Phuoc Tuy Province, to drop ammunition to the troops who were down to a few rounds each. The helicopters could not land because of the weather, and were forced finally to drop the small arms ammunition down through the trees on to a position marked by smoke. They were right on target. Over the radio came a voice unmistakably from a digger: "You bloody beaut, that was smack on."

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Later, when the battle had subsided a little, the choppers queued up and landed one by one in a small clearing by the lights from armoured personnel carriers to pick up the Australian dead and wounded. It was the major action so far for the Iroquois of No. 9 Squadron since they arrived in South Vietnam last June aboard the troop carrier "HMAS Sydney" from Australia. As one enthusiastic chopper pilot put it "The army would be sunk without us." Allowing for intense onesidedness, there is no doubt that the helicopter is proving invaluable in Vietnam.

Army mobility has never been so good. Certainly the choppers have helped the troops come to grips with the Vietcong, and saved hours and sometimes days of foot-slogging to get to strategic positions. The Iroquois enable a soldier to travel light, thereby increasing his effective speed, knowing that a R.A.A.F. chopper will drop down when needed with food, ammunition, water and fresh clothing.

If a soldier is wounded, medical care is awaiting him at the nearest field hospital, or even back at base, without hours of dangerous delay in poor conditions in the jungle. Just as important, the rest of the force are not committed to slowing down to care for the wounded, and are left free to carry out their commitments, knowing their comrades are being cared for. Because of the small force of R.A.A.F. helicopters, when a whole battalion has to be moved to another area, American helicopters are called in. If necessary thirty or more helicopters are deployed to move the troops.

A recent role for the R.A.A.F. choppers is dropping leaflets to the Vietcong. Army intelligence tracked the movements of the two Vietcong battalions which clashed with 6 R.A.R., and the R.A.A.F. choppers have been "seeding" the areas vigorously with a variety of leaflets. The leaflets, prepared by the U.S. Army Psychological and Passive Warfare Department, depict a lone Vietcong survivor surrounded by his dead comrades. Written on the leaflet are the words, "When will it be my turn." The message also urges the Vietcong to stop the senseless slaughter and return to the Government side where they will be warmly received and immediately reunited with their family.

Another task undertaken recently by the R.A.A.F. helicopters has been the distribution to needy villagers of rice captured from the Vietcong by Australian troops. The rice, in two-pound bags, with raisins, powdered milk and tinned foods, was distributed in small lots to the villagers following the liberation of the village by the 5th Battalion, R.A.R. During their occupation of the village, the Vietcong evidently ate most of the available food, because the Australians noticed many cases of malnutrition among the villagers.

With such tasks behind them, despite their short term in Vietnam, the R.A.A.F. Iroquois have earned the respect of the Australian and United States troops in the area.

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The Officers' Pensions Society

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The Society's activities influenced the grant of: **Increases** in Officers' Widows' Pensions from December, 1952, and in the retired pay of some 8,250 officers from April 1st, 1954; the **1956, 1959, 1962 and 1965 Increases for all retired Officers** over 60 and for **widows.**

The Society was founded in 1946, and its **objects are** to procure the improvement and increase of pensions, retired pay, and other benefits of officers and widows of **the three Armed Services;** and to promote in every way their interest and welfare.

It is the only body comprising officer members from all three Services whose policy is controlled solely by its members. It is complementary to, and works in co-operation with, the Royal Air Forces Association, the Association of Retired Naval Officers, the Officers' Association or other Service Associations.

Membership is open to retired officers, to dependants of serving or retired officers, and to widows and dependants of deceased officers of the Armed Forces. **Membership now exceeds 29,500,** which number is increasing every day.

The annual subscription is £1 for all, except widows and dependants of deceased officers, for whom it is 5s.

Full particulars and forms of application can be obtained from:

The General Secretary, The Officers' Pensions Society, Ltd.
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The Bermudan-rigged sloop, "Highlight," sailing in the Mediterranean off Cyprus with an R.A.F. crew abroad.

(Crown Copyright Photo)

R.A.F. Sailing 1966

By A. F. Tinsley

So much sailing goes on annually in the R.A.F. at home and overseas, that were it possible to keep one big log-book for all its sailing organisations about the world, figures for hours spent afloat and nautical miles covered would be astronomical. In Britain alone, around the coasts and on rivers, reservoirs, canals and lakes, the R.A.F. Sailing Association burgee flutters at the mastheads of prodigious numbers of dinghies, and of lovely cruising yachts and ocean-racers. Abroad in Germany, the Near, Middle and Far East, and even in Australia, hundreds of officers, airmen and airwomen sail either competitively or for the sheer pleasure and relaxation of the sport. Wherever one goes he finds R.A.F. sailing well organised; clubs stocked with craft bought either with Service funds or with money from that most generous of all Service benefactors, the Nuffield Trust; plenty of experts on hand to coach the tyros in the joys of sail.

Since the R.A.F.S.A. opened the 1966 home season auspiciously in April by defeating the Navy, Army and Civil Service at Shepperton in Pegasus dinghies to win the "Victory Trophy" for the first time, 1966 has proved a year of sailing achievement and adventure on many waters, including the high seas. In competition the R.A.F. has done well. In voyaging its enthusiasts have braved and conquered oceans. In ocean racing it has had, perhaps, less success than in past years, but has still sailed with distinction. In the cruising field its several fine yachts, including, at home, "Sperling," "Watchfull" and "Jethou," have again been busy transporting many Service people on delightful healthful and inexpensive holidays and expeditions.

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Progress this year was first illustrated in May, when a fine new £10,000 Class III sloop, "Contrail," was launched at Cowes, paid for jointly by the R.A.F.S.A. and Nuffield Trust, to join the already tried and true sloop-rigged Class II "Dambuster," perhaps the finest racer the R.A.F. ever had. Though "Contrail" has not enjoyed a very victorious first year she has shown herself a fine fast boat, with a great potential, and much is hoped of her next year when those who sail her know her better. So far nearly 100 people have sailed in her, and she has covered nearly 4,000 miles in competition. "Contrail" was first and "Dambuster" second in the Inter-Services race for the Princess Elizabeth Cup, second in her class in the Hamble - Alderney race, fourth in the Channel Race and the Wills Trophy, fifth in the Harwich - Hook contest, and sixth in the Southsea - Harwich race. "Dambuster," fourth in the Channel race, won the concurrently-run Inter-Service Cup Race, as in 1965, with "Contrail" second.

R.A.F.S.A. teams have enjoyed several successes overseas in the dinghy field. In Gibraltar an officers' team, sailing Victory class keelboat dinghies, defeated Royal Gibraltar Y.C. for the Association's first win in this event since its inauguration years ago, and a non-officer team decisively beat R.A.F. North Front, sailing Albacores. At home the R.A.F. regained the coveted Coningham Cup, sailed for in Mermaid keelboat dinghies, defeating the Army and Navy. Sailing its three new Albacores at Thorpe Bay the R.A.F. won the British National Albacore Championship. Visiting Cyprus, an R.A.F.S.A. team met local clubs with varying success, and en route home paused in Malta to sail against local teams. In Sicily they became probably the first R.A.F. helmsmen to sail against the Italians. In individual races they took on the Italians at Mondello Y.C., Palermo, in Finns and Flying Juniors, in which they found the Italians pastmasters. "We didn't win against such high-calibre sailing, but it was fun and our hosts were extremely kind" said Squadron Leader Michael Richards, Rear-Commodore, Dinghies, R.A.F.S.A.

Flight Lieutenant John Maynard, has brought much kudos to R.A.F. sailing this year. At present one of the few R.A.F. Finn experts, he won the British National Finn Championship at Poole, the first R.A.F. man to do so, and was invited to represent Britain in two of the world's greatest Finn events—the Finn Gold Cup (emblematic of the world championship) at La Baule, Brittany, and the European Single-Handed Championship at Attersee, Austria. That he found the cream of the world Finn helmsmen from some 25 nations too good for him did not matter. What did was that an R.A.F. officer had been chosen to sail for Britain. At La Baule, he said, he was out-speeded, and at mountain locked Attersee the peculiar wind conditions were more than he could solve. In the fifth race at Attersee he did well to be placed twelfth among 50 competitors

Visiting R.A.F. Mount Batten in September, I discovered that although they don't say much about themselves, the local R.A.F. sailors are quite a power afloat, and have enjoyed a highly successful season. Captained by Flight Lieutenant Maynard the station team, otherwise comprising Warrant Officer Donald James, Sergeant Terry Counellan and Wing Commander D. T. Beamish had had the temerity, in such a famous Naval stronghold as Plymouth, to win the Admiral's, of C-in-C's Cup for the third successive year sailing R.N.S.A. dinghies against all the Services at Ply-

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mouth. Maynard rubbed salt in Naval wounds during Plymouth Week by winning the single-handed race in Finns from Yealm to Plymouth, and as if this were not enough, R.A.F. Mount Batten's whaler won the points championship in Plymouth Week. In Sutton Harbour Regatta, oldest regatta in Plymouth, the R.A.F. whaler sailed away with the famed Wigfull Cup, and in the Plymouth - Fowey and return race run by the R.N.S.A., annually for the Beadle Cup, the whaler with the roundel won both ways, defeating an opposition of R.N. and R.M. whalers.

But of all that has happened so far this year there is no better progress and achievement story than that of the 1966 R.A.F. Individual Dinghy Helmsman Championships in Plymouth Sound in September.

As for the past two years, R.A.F. Mount Batten was host to this biggest R.A.F.S.A. dinghy event, contributing immeasurably to its success. Its C.O., Wing Commander Beamish competed, and his station provided R.A.F. Pinnace No. 1392 for a Committee Boat, with a fine willing airman crew under coxswain Corporal Michael Radcliffe, made available its fine slipway beside the Cattewater, and extended the hospitality of its pleasant Water Sports Club.

Indicative of the ever-growing support for dinghying in the R.A.F. the fleet comprised a record 82 Fireflies from 45 stations, and 164 helmsmen and crews. Drake's Sound had never seen a dinghy turnout like it.

From the four races sailed of the scheduled six, there emerged a new and worthy champion. He was L.A.C. David Gay, a magnificent helmsman who has done much for R.A.F. sailing in the past. Sharing his triumph was his crew, S.A.C. Bertie Gaston. L.A.C. Gay in his speedy little Firefly No. 3000, in the roughest possible conditions won Races 5 and 6 by devastating margins to clinch the championship. In his superb sailing one saw how he had earlier won the Welsh Dinghy Championship in Enterprises, placed third in the Welsh Albacore Championship and the British National Firefly Single-Handed Championship, and been second in the Reculver Cup Trophy. He took home the Brady Cup, the McDonald Trophy given by thte R.A.F.S.A.'s first Commodore, Air Marshal Sir Arthur McDonald, for the winner of Race 6, and the Tinsley Trophy presented last year for the winning Command, this year Transport Command, in which Gay was one of the three winning scorers.

Space precludes mentioning others who did well and sailed so keenly and so bravely in, to many of them, unknown waters with baffling tides and currents, and in gales blowing almost incessantly at Force 4 to 6 intensity. But one can congratulate them and say well done for helping to make the Plymouth meeting the biggest R.A.F. Firefly event ever staged.

In another dinghy venture in July, seven W.R.A.F. airwomen crewed for qualified R.A.F.S.A. helmsmen in 10 Fireflies of the R.A.F. Lyneham Sailing Centre, in the gruelling Thames Tideway race from Putney to Tower Bridge and back.

The year saw two noteworthy long-distance R.A.F. voyages which demanded great determination and fortitude, and outstanding helming, navigation and initiative. In one, seven intrepid young airmen from F.E.A.F. sailed their ketch, "Look Wide," 9,000 miles from Seletar to Plymouth as an expedition training venture. The ketch

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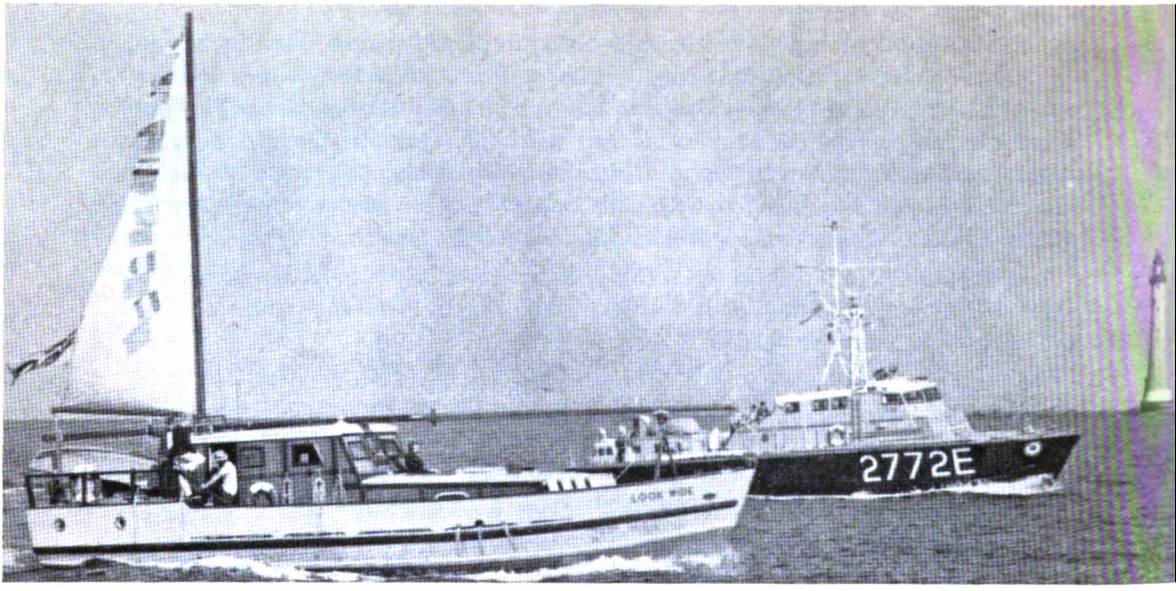

Dressed overall, the ketch "Look Wide" ends her 9,000-mile voyage from Singapore at the Eddystone Light under escort by an R.A.F. Marine Branch high-speed search and rescue launch.
(Crown Copyright Photo)

was built for £2,500 which the airmen paid themselves, by a Chinese to the design of her skipper, Corporal (now Sergeant) A. C. McLean. His companions in the epic voyage which began in early March and ended in mid-August, were Corporal P. Larner, Jr. Technician G. Graham, S.A.C. P. Burgin, S.A.C. C. T. Meades, S.A.C. M. Lane and S.A.C. T. Williams. They sailed "Look Wide" home via Penang, Colombo, Masirah Island, Aden, the Suez Canal, Malta, Messina, Bonifacio, Marseilles, the French canals, Bordeaux and Brest in a journey which, though fraught with rudder trouble and considerable engine and other mechanical difficulties, they pressed doggedly on. At Catania the harbourmaster, at first worried because they had no registration papers, eventually registered "Look Wide" as a warship for berthing purposes. At Plymouth the airmen arrived to a vociferous "welcome home" by R.A.F. marine craft from Mount Batten, a helicopter from St. Mawgan, and a boatload of press which met them off the Eddystone Lighthouse, and were delighted to receive congratulatory messages from Lord Shackleton, Minister of Defence for the R.A.F., from the Commander, Far East Air Force, Air Marshal Sir Peter Wykeham, and from the R.A.F.S.A.

The other voyage was from Southampton to Cyprus, sailed in three stages by two officers, three airmen and a W.R.A.F. officer, Flight Officer Joan Hopkins, in the 11-ton Bermudan-rigged sloop, "Highlight," now cruising for the N.E.A.F. Cruising Association. On the 1,000-mile demanding stage from Southampton to Marseilles, 188 French canal and river locks had to be negotiated during the 28-day trip. The W.R.A.F. officer, as crew, Chief Technician Reeve, M.M., skipper, and Sergeant Kenneth Hawkins, mate, took "Highlight" to Marseilles where the airmen met Group Captain John Sturgess, chairman, N.E.A.F.C.A., and S.A.C. John Marks who took the yacht on to Cyprus, picking up Squadron Leader Spencer at Malta.

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AIR OFFICER APPOINTMENTS ROYAL AIR FORCE

MINISTRY OF DEFENCE (AIR)

AIR MARSHAL SIR CHARLES BROUGHTON, K.B.E., C.B., as Air Member for Supply and Organisation (August, 1966).

Air Marshal Sir Charles Broughton (54), born at Rotherham; educated in New Zealand and the R.A.F. College, Cranwell, from where he passed out in 1932. After serving with No. 111 fighter Squadron he went to India in 1933 to No. 11 bomber Squadron. In 1941 he commanded No. 48 General Reconnaissance Squadron, in 1942 he took the R.A.F. Staff College course; then commanded No. 246 Wing in the Middle East. In 1945 he joined the directing staff of the R.A.F. College, Haifa; in 1952 he attended the Imperial Defence College. From 1955 to 1958 he was on plans duties at Far East Air Force and then became Senior Air Staff Officer, R.A.F. Transport Command. After serving as Director-General of Organisation, he was appointed as United Kingdom Member, Permanent Military Deputies Group, C.E.N.T.O.

AIR MARSHAL G. R. GUNN, C.B., O.B.E., M.B., CH.B., D.P.H., as Director-General of Medical Services (Royal Air Force)—(January, 1967).

Air Marshal George Roy Gunn (55) Principal Medical Officer at R.A.F. Bomber Command since July, 1965, was born in Edinburgh and educated at the Royal High School. He took his medical degree at Edinburgh University and joined the R.A.F. Volunteer Reserve in June, 1939, receiving a permanent commission in the R.A.F. Medical Branch in 1945. During the War he served in Britain, India and Burma and was five times mentioned in despatches. In 1955-57 he was Senior Medical Officer at No. 11 Group; was in the Directorate-General of R.A.F. Medical Services in 1957-61, and in 1961-63 was Principal Medical Officer, R.A.F. Germany. Before going to Bomber Command he was Director of Hygiene and Research (R.A.F.). He was appointed an Honorary Physician to The Queen in July, 1965.

AIR VICE-MARSHAL E. S. SIDEY, M.D., CH.B., D.P.H., as Deputy Director-General of Medical Services (Royal Air Force)—(August, 1966).

AIR COMMODORE E. D. CREW, D.S.O., D.F.C., as Director of Operations (Air Defence and Overseas)—(November, 1966).

AIR COMMODORE A. G. DOUGLAS, C.B.E., M.C., A.D.C., as Director of Ground Defence and Commandant-General of the Royal Air Force Regiment (November, 1966).

AIR COMMODORE D. B. FITZPATRICK, O.B.E., A.F.C., as Director of Quartering (R.A.F.)—(August, 1966).

AIR COMMANDANT PAULINE GILES, R.R.C., as Matron-in-Chief, Princess Mary's R.A.F. Nursing Service (September, 1966).

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FLYING TRAINING COMMAND

AIR MARSHAL SIR JOHN DAVIS, K.C.B., O.B.E., M.A., as Air Officer Commanding-in-Chief (October, 1966).

Air Marshal Sir John Davis (55) has been Air Member for Supply and Organisation since August, 1963. Born in Cardiff and educated at Whitby Grammar School and Queen's College, Cambridge, he joined the R.A.F. in 1934. He flew with bomber squadrons and was an instructor at a Flying Training School before taking a specialist course at the School of Air Navigation in 1937. After the outbreak of war he served with R.A.F. Middle East before being seconded as a navigation instructor to the Turkish Air Force.

In 1942 he took command of No. 269 Squadron, engaged in anti-submarine duties from Iceland. He joined Headquarters, No. 19 Group, Coastal Command, for operations duties in 1944, and later commanded R.A.F. Stations, Lagens (Azores), and St. Eval, Cornwall, before graduating at the R.A.F. Staff College at Bracknell, where, following duty at the Air Ministry in 1946-47, he joined the directing staff. From 1951 he was head of the Air Plans staff at H.Q., Middle East Air Force. Returning to Britain, Air Marshal Davis took a course at the Joint Anti-Submarine School before taking over command of R.A.F. Station, Topcliffe, Yorks., in October, 1953.

After attending the 1955 Imperial Defence College course, he spent three years as Director of Plans at the Air Ministry, was Senior Air Staff Officer at H.Q., Bomber Command, and in 1959 became Air Officer Commanding, No. 1 (Bomber) Group. He was Air Officer Commanding, Malta, and Deputy Commander-in-Chief (Air), Allied Forces Mediterranean 1962-63.

AIR VICE-MARSHAL F. D. HUGHES, C.B.E., D.S.O., D.F.C., A.F.C., as Air Officer in charge Administration (September, 1966).

BOMBER COMMAND

AIR VICE-MARSHAL J. CLARKE TAYLOR, O.B.E., B.SC., M.B., CH.B., D.P.H., D.I.H., as Principal Medical Officer, R.A.F. Bomber Command (January, 1967).

COASTAL COMMAND

AIR VICE-MARSHAL J. H. LAPSLEY, C.B., O.B.E., D.F.C., A.F.C., as Air Officer Commanding No. 19 Group (February, 1967). This appointment carries with it the N.A.T.O. appointment of Commander, Maritime Air, Central Sub-Area Eastern Atlantic and Commander, Maritime Air, Plymouth Sub-Area, Channel.

TRANSPORT COMMAND

AIR VICE-MARSHAL V. C. OTTER, O.B.E., F.R.AE.S., as Air Officer in Charge Engineering (December, 1966).

CRANWELL

AIR COMMODORE R. G. WAKEFORD, M.V.O., O.B.E., A.F.C., as Assistant Commandant Cadets (October, 1966).

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FAR EAST AIR FORCE

(Overseas)

AIR MARSHAL S. W. R. HUGHES, C.B., C.B.E., A.F.C., F.R.Ae.S., as Commander, Far East Air Force (August, 1966).

Air Marshal Sidney Hughes (51) born at Auckland, New Zealand, transferred from the Royal New Zealand Air Force to the R.A.F. in 1938. After flying bombers in Britain, he turned to flying-boats, and at the outbreak of war was a Sunderland pilot of No. 230 Squadron in Singapore. He commanded a Squadron in the Western Desert and served on the staff in the Middle East until early 1945, when he returned home to command No. 511 Squadron of York transport which then maintained a double daily schedule to the Far East from England.

In 1941, in the Middle East he was captain of a Sunderland which had to force-land following damage in a combat with two Messerschmitt 110s, one of which was shot down and the other put to rout trailing smoke. The Sunderland was "sailed" to the coast of Cyrenaica and Flight Lieutenant Hughes and his crew, who were first captured, finally escaped and walked back to the British lines together with 150 prisoners who they "collected" en route.

In 1947 he was seconded to the U.S.A.F. and served as Chief of Operations of the All Weather Flying Division where, as a pilot, he took part in experimental flying including early research into landing in fog and flight through thunder-storms. After Air Ministry duties as an Assistant Director of Training (All Weather) and as a Deputy Director of Operational Requirements, he commanded the Experimental Flying Department of the R.A.E., Farnborough, took the 1955 Imperial Defence College course, and was then Station Commander, R.A.F. Jever, Germany. He was later Air Member and Chairman of the Defence Research Policy Staff of the Ministry of Defence and became Air Officer Commanding, No. 19 Group, R.A.F. Coastal Command, in February, 1962. From 1964 until his new appointment he was Deputy Controller of Aircraft (Royal Air Force) at the Ministry of Aviation.

AIR FORCES MIDDLE EAST

AIR COMMODORE W. J. BURNETT, D.S.O., D.F.C., A.F.C., as Air Officer in charge Administration at Headquarters A.F.M.E., Aden (October, 1966).

RETIREMENTS

AIR VICE-MARSHAL R. B. THOMSON, C.B., D.S.O., A.F.C.

AIR VICE-MARSHAL J. C. POPE, C.B., C.B.E., M.I.MECH.E., F.R.AE.S.

AIR COMMANDANT DAME VERONOCA ASHWORTH, D.B.E., R.R.C., Q.H.N.S.

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The last of the truly great war memoirs

WITH PREJUDICE

by MARSHAL OF THE ROYAL AIR FORCE

LORD TEDDER

"Few volumes have yet appeared which make so clear the complexity, as well as the gravity, of the problems which confronted the Allied commanders in the Second World War, or shed more light on the methods by which they were solved" — MICHAEL HOWARD Sunday Times.

"Has a lasting value as a handbook of air power and an historical account of the hard way in which this was learnt."
— Brig. W. F. K. THOMPSON Daily Telegraph.

Here is one of the most unrestrainedly outspoken memoirs of the Second World War, endorsing what history has already shown—that Lord Tedder was one of the greatest of all British Commanders. Lord Tedder never suffered fools gladly or in silence and the years have not lessened his impatience. "In these memoirs" he says, "I mean to record the course of events as I saw them. I shall be as objective as I feel it possible to be, but I have no intention of departing for any reason from my own honest opinion as to events and personalities. So often people make great play about being completely unprejudiced. Frankly I am completely prejudiced."

704 pages, Demy 8vo 16 pp illus, 8 maps, 63/- net

CASSELL

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Book Reviews

WITH PREJUDICE

By Marshal of the Royal Air Force Lord Tedder, G.C.B.

(Published at 63/- by Cassell & Co. Ltd., 35 Red Lion Square, London, W.C.1)

Tedder's war started before 1939, when he was dealing with the weapons the Royal Air Force was to use, but it was in the Western Desert where he showed for the first time how the full use of air power could be scientifically employed.

No-one will dispute the fact that the 'air war pattern' was originally conceived at Tedder's Cairo H.Q. His conception of how the air arm could produce maximum effect was demonstrated, first in the Western Desert, later by carpet bombing before Tunis, then for making possible the attack on 'the soft underbelly of Europe.'

Because this air war pattern was essentially Tedder's, he was chosen as the British deputy to the American Commander of all allied forces arrayed for the Second Front.

In WITH PREJUDICE the air plan unfolds as our strength develops. By the time the reader comes to the end of the book not only has the complete new pattern of air warfare emerged, but also, by the detailed accounts of the effect on the enemy, the Tedder way is proven.

Should the world ever be faced with another major war perhaps a new pattern will have to be found. We must hope that somewhere there is a young Tedder with ideas. That is what the author of WITH PREJUDICE undoubtedly had and many of his tactics had never previously even been contemplated.

Seated with a scribble pad outside his caravan on a promontory overlooking the sea at La Marsa, in Tunisia, where General Eisenhower had his Command Post for the attack on Italy, Tedder did much of the draft planning for the vital role allied air forces had to play. This was the formula for the participation of the allied air forces for the Second Front.

"The Chief" is a modest, sensitive man who, like most visionaries, prefers the simple things. During the war he had a knack of getting on with the job without getting bogged down with ponderous service routine. In a way, he was a poet, and much of the early part of WITH PREJUDICE, coming as it does straight from his 'journal' (which, in fact were the daily letters he wrote to his wife) reminds one of Wavell's writings.

In their different ways both Wavell and Tedder were artists. Indeed, Tedder can be described literally as that, and twelve of his sketches illustrate the book. There is a splendid pencil drawing of Winston Churchill in the pilot's seat of an aircraft in which the two of them were travelling. The likeness could not be bettered, although the sketch was a back view.

But the delicate, rather wispy drawings by the author should not mislead. This is a hard-hitting book. More than once it has been said that Arthur Tedder never suffered fools gladly or in silence. Yet in WITH PREJUDICE there is no snarling, as is sometimes apparent in books by senior officers. Tedder uses a rapier for his attacks and often it has been cloaked in the puckish wit which we who served with him know so well.

The opening section of the book is entitled OVERTURE 1932-1940, and this mostly concerns the production of the weapons available to the Royal Air Force for the Hitler war. The Air Ministry Supply Board became the Ministry of Aircraft Production and there is a violent clash of personalities between Lord Beaverbrook and Tedder. The letter which the latter sent to the Air Minister reveals a state of affairs so far unknown to most of the British public.

Tedder's appointment as Air Officer Commanding-in-Chief, Middle East, could perhaps be described as a providential accident. Air Marshal Owen Boyd was to succeed Longmore, but he was captured on the way to Cairo. Tedder, whose appointment to the Middle East had previously been checked by Churchill, was sent off post haste. WITH PREJUDICE tells how he coped with the job, first with forces so limited that all his administrative technical knowledge was needed to keep aircraft operational and correctly deployed; then later, when the east and west North African land forces met and he had under his command the greatest

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weight of air power ever assembled. Then the Tedder pattern for air warfare became clearly established.

The second half of the book, NORTH-WEST EUROPE, December 1943 - May 1945, shows how the senior R.A.F. and American officers dovetailed the varied air elements into an overall plan of strategic air offensive, and tactical attack to support the allied armies in the field.

Inevitable the book contains detailed, 'though not always so readable' material required by historians of the future. Included are many documents previously unsuspected.

But the message for posterity of WITH PREJUDICE is pure Tedder. He includes it in his own summing-up:

. . . The outstanding characteristics of air-power proved to be its flexibility and the terrific concentration . . . This seems simple enough, but that applies to all great truths after they have been discovered. George Houghton.

S.O.E. in France, by M. R. D. Foot (H.M.S.O., London; 550 pp.; illustrated; 45s.).

Evening after evening, the people of Britain sit in front of the mesmerising screen of the telly, lapping up the improbable adventures of Batman, or marvelling at the courage and ingenuity of the men from Uncle. It would be a waste of time trying to persuade most of them to switch off and divert their attention to a 550-page product of Her Majesty's Stationery Office, with dry-looking footnotes on each page, a bundle of maps packed into the back and only a thin section of illustrations in the middle.

If, in fact, they had the gumption to do so, they would soon realise that Batman and Ilya are pretty feeble characters compared with the men and women of the Special Operations Executive whose wartime deeds are recorded so well in this book.

The S.O.E. was a British secret service, formed in 1940 to encourage underground resistance to Nazi Germany. In this book, Mr. Foot presents for the first time, from a blend of official and less official sources, an account and analysis of the S.O.E.'s work in France. The scene is set, admirably, on page 12, where the author comments:

"S.O.E.'s work was true to the tradition of English eccentricity; the sort of thing that Captain Hornblower or Mycroft Holmes in fiction, or Admiral Cochrane or Chinese Gordon in fact, would have gone in for had they been faced with a similar challenge; the sort of thing that looks odd at the time and eminently sensible later. . . . . To think up schemes of piratical daring in a war that opened with ceremonial dress and sword drill; to wage in the early forties a kind of warfare that did not become common till the late fifties; such feats argue some imaginative capacity.

"The key characteristics of S.O.E. operations were suddenness, subterfuge and flexibility; stabbing attacks were planted between the chinks of the enemy's military and economic armour. These were meant to induce in him a feeling of insecurity, and to weaken him strategically; both directly by material loss, and obliquely by dispersing his forces on to police tasks."

It is good that this history of the S.O.E. should have been written, and it is good that this particular author should have been given the job. As an intelligence officer to the Special Air Service Brigade, Mr. Foot had a brief spell behind the lines in France, in uniform, gaining a severe wound and a Croix de Guerre in the process of organising escapes. This means that he brought to his task a unique blend of personal experience of the kind of conditions under which the S.O.E. agents operated and the calmly analytical mind of a professional historian.

Those seeking Sunday paper sensationalism and sadism will not find it in his record. In fact, Mr. Foot is critical of those writers who have sought fame and fortune by embellishing accounts of the experiences of S.O.E. personnel with tales of tortures which did not take place. The facts do not need such embellishment. There is courage and heartbreak here in plenty, in plain truth. One example will suffice, for the merciless butchery of the Nazi war machine is summed up in the few lines which tell of the fate of Noor Inayat Khan, Yolande Beekman, Eliane Plewman and Madeleine Damerment at Dachau. "First thing in the morning, they were called out together into a sandy yard, and told to kneel down by a wall. They saw the old bloodstains in the sand, and knew their fate. They knelt two and two, each pair holding hands; an SS man came up behind them and shot each of them dead, neatly, through the back of the neck."

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(1966 Revised Edition)

Customs of the Services

BY GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RETD.)

The authorised reference book on Tradition and the accepted Service Customs observed by Officers on and off Duty

AFTER extensive research into the Traditions of the Services and more than 30 years experience of the Customs of the Services while serving in the Army and Royal Air Force, the author, with assistance from the Assistant Chief of the Air Staff (Training) R.A.F.; Lieutenant-General Sir Frederick Browning; The Lord Chamberlain's Office, Commandant, Royal Military Academy; Commandant, R.A.F. Staff College; Commandant, R.A.F. College; Brigadier C. T. Tomes (Military Historian) and many other well known authorities, was enabled to publish what hitherto had been known as "The *unwritten* Laws for Observance by Officers".

For the past 30 years Service Authorities have recommended "CUSTOMS OF THE SERVICES" as an invaluable reference book, particularly for the guidance of newly commissioned officers.

It contains extensive coverage of Service Customs and the conduct expected of officers both in Service and social activities.

Since the first edition modern trends have varied to some extent the Service and social customs of three decades ago; these are all incorporated in the 1966 edition.

The Air Ministry, now Ministry of Defence (Air), reviewed this book, concurred in the advice given, and recommended it for use of officers.

Officers of Foreign Military Powers have found this book of the greatest assistance when serving with British Military Forces.

The 1966 revised edition is now obtainable from booksellers or direct from Messrs. Gale & Polden Ltd., Wellington Press, Aldershot. 10/6d. net (By post 11/6d.).

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Such was the price paid; but the achievement was great. The whole strength of all the sections operating in France, and of a due proportion of the signallers, aircrew, R.A.F. ground staff, packers, tailors, forgers, coders, typists, instructors, and staff officers that backed them did not amount to three brigades; the front-line strength of agents actually employed did not amount to one. Yet the effort they produced has been assessed as certainly not less than that of half a dozen divisions of three brigades each. The Germans had to devote eight of their 60-odd divisions in France to the attempt to hold down their rear areas while the invasion of Europe was going on in June, 1944. So effectively did the French resistance work, under the inspiration of and supplied by its British friends, that one German armoured division, having travelled from the Russian front to Strasbourg in a week and a day, then took 23 days more to fight its way through to the formal battle-front at Caen.

In so short a review, one can do little but refer to the *dramatis personae* and give an idea of what the drama is about. The book itself makes proud reading and is a very worthy addition to the fine H.M.S.O. official histories of World War 2. J.W.R.T.

Aviation, the Creative Ideas, by Oliver Stewart (Faber, London; 244 pp.; illustrated; 35s.).

Oliver Stewart, like the late C. G. Grey, never fails to be provocative and eminently readable, whatever his subject. As Editor of *Aeronautics* some years ago, he began an Editorial with the startling comment "Major war is on the way . . ." Whether or not one agreed with what followed, one read it and respected it as the view of somebody who had been in aviation a long time, as pilot and journalist.

One critic of this book commented that its "weakness lies in the fact that Mr. Stewart is not an engineer." The critic, of course, *was* an engineer, and one only wishes that Oliver Stewart might have an opportunity of commenting that his critic's latest piece of ironmongery is no good because he isn't a journalist or a member of the I.R.A. or Brownies.

Every man to his trade, and Oliver Stewart is a superb raconteur. His purpose in this book has been to look at some of the major ideas and inventions which have led to progress in aviation and to tell us something of their originators, most of whom he knew personally.

Reverting to Mr. Stewart's provocativeness, it emerges in the very first chapter when he asserts that Clement Ader preceded the Wright brothers as the first to make a powered flight. There is nothing new in the claim, and the author produces no startling new discoveries to support his contention. But this does not mean that it should be dismissed because historians now accept the Wright brothers' claim without further question. It is not many years since Stringfellow had a much higher rating as a pioneer than he really deserved; Cayley, on the other hand, has only recently received the full credit for his tremendous achievements as the father of aeronautics. Whether or not there is material yet undiscovered that will give added stature to Clement Ader, there is sufficient element of doubt to justify Oliver Stewart's attempt to keep the controversy alive.

He is on stronger ground when discussing in the following chapter the early work of A. V. Roe. There is little doubt that this British pioneer was the supreme aeronautical engineer of the immediate post-Wright era. This became clear when a replica of one of his 1910 triplanes was built for the film of *Those Magnificent Men* and was found to fly beautifully without modification of Roe's original design. The same was by no means true of other types in the film, such as the much-admired Antoinette.

Again, historians may dispute the author's statement that Roe made the first flight in Britain in June, 1908. This involves one of the most heated controversies in aviation history. The reviewer, in this case, is on the side of Oliver Stewart. Roe himself believed he was first and stated categorically that he *did* fly in June, 1908. Anyone who ever met him will know that so modest and great a man would never claim anything to which he was not entitled; that alone should be enough to put the record straight.

There is much more that is of great interest in this book. Here are recorded the beginnings of rotating-wing flight, jet-lift, boundary-layer control, variable-geometry and safety devices from the Sutton harness to ejector seats. There are occasional errors of fact, and sometimes Mr. Stewart lets his liking for individuals—always well justified—cause him to credit them with

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THE THIRTY-NINE STEPS AND THE POWER HOUSE: *John Buchan.* Two 'thrillers' in one volume. 7s. 6d.

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PRISONER ON THE KWAI: *Basil Peacock.* The story of a gunner-major who was captured by the Japanese. So absorbingly told that one relives his captivity with him, and meets his fellow-men working on the Kwai railway. Yet it does not dwell on tortures and the like. It is surprisingly rich in humour and in the colourful life of Thailand.
2 *maps* 25s.

'WILLYNILLY' TO THE BALTIC: *John Seymour.* In a Northumberland 'coble', using only sail and oar, the author explores the waterways and coasts of Holland and Germany, and the Danish islands. Mogador ('Hardaars the Oar-breaker'), and later Sally Seymour, are his crews.
39 *photographs, 7 charts* 36s.

I SPEAK OF AFRICA: *James Halliday.* This is how reviewers have described the novel about Africans given Independence in a mythical British Colony: wise; funny; elegant and amusing; witty; shrewd satire. Others have compared it with *Sanders of the River* and *Some Experiences of an Irish R.M.* 18s.

BUTT AND BEN: *Donald Sutherland.* A story, much-praised, of a Highland boyhood. The humours, wonders and eccentricities of life in Argyllshire fifty years ago. *Illustrated by Gavin Nicol. Second Impression* 21s.

PARA HANDY TALES: *Neil Munro.* The adventures, always amusing and sometimes breath-taking in their audacity, of a 'puffer'—a small Scottish cargo steamer—the *Vital Spark,* and her crew about their lawful (and unlawful) occasions. So popular that they have been twice televised, and made into a film.
Sixteenth Impression 15s.

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"first" which do not rightly belong to them. An example is his tendency to give Barnes Wallis too much of a monoply in variable-geometry concepts, coupled with rather more enthusiasm for the idea than it deserves.

One sentence that should be on the conscience of the mis-managers of Britains aviation policy for the past decade is that "Among the aerial inventions designed to serve the air traveller, there have been few more remarkable and worthy of development than the Rotodyne." The abandoning of this brilliant pioneering VTOL transport was the civil aviation counterpart of the disastrous, short-sighted and almost criminal scrapping of the military TSR.2. J.W.R.T.

Aeromarine Origins, by H. F. King (Putnam, London; 93 pp.; fully illustrated; 30s.).

As a former Editor of *Flight International,* Mr. King was responsible for inaugurating as an offshoot of that magazine the newer monthly *Air Cushion Vehicles.* He has now united his twin interests in this slim but valuable work which traces the origins of over-water flying. He covers the whole spectrum from the pure flying-boat to devices that were more boat than aeroplane, and proves that the Hovercraft is by no means such a modern concept as we are often lead to believe.

Even more remarkable is the story of the Rev. Charles Meade Ramus of Playden, near Rye, who invented the planing boat, or hydroplane, nearly a century ago and also suggested to the Admiralty that they should build 140-ton rocket-powered pilotless rams which "would sweep away all existing navies and . . . render war at sea no longer possible."

The links between such devices and pre-1914 flying might seem tenuous; but they are important and *Aeromarine Origins* forms a valuable addition to recorded history for the student, collector or flying-boat enthusiast. It is no coincidence that the Wright brothers clearly believed floats to be better than wheels as a means of unshackling their biplane from the catapult launching gear that limited its versatility. One of the many remarkable pictures in this book shows them testing a set of full-scale hydrofoils for a projected amphibious version of their aircraft, in 1907.

Henri Fabre receives due credit for being the first to build and fly an aeroplane able to take off from water, in 1910. This respected pioneer is still alive and, now aged over 80, continues to sail his single-handed dinghy in the waters off Marseilles.

Inevitably, Glenn Curtiss emerges as the real father of practical water-flying; but one's admiration for the genius of A. V. Roe is enhanced by the picture of the seaplane which he built for Commander Oliver Schwann in 1911. It is so clearly a real aeroplane by comparison with the quaint caricatures of aircraft that most other people were designing at about that time.

The flying-boat may be largely extinct today, but it is significant that the team responsible for designing and building the first successful Hovercraft, at Cowes, belonged to the company that gave us, after World War 2, the mighty Princess flying-boat and the world's first jet fighter flying-boat. The marine aircraft may yet give birth to other equally exciting forms of air-riding vehicle, able to skim across the surface of the water at many times the speed of the fastest ship and so shaped that much of their weight is supported by aerodynamic lift.

America already has a 100-ton surface effect ship of this kind on the drawing-board; but one must be careful in the use of that word "already". Sir John Thornycroft, it seems, designed an air cushion hull for H.M.S. *Lightning,* the Royal Navy's first torpedo boat, in 1877. Clement Ader of France even designed a device with "swing-wings", albeit a boat rather than an aircraft, in 1904. Truly, there is nothing new under the sun and one must be grateful to Mr. King for the immense amount of research that must have been necessary to unearth so much that is new to recorded aviation history. J.W.R.T.

Angels without Wings, by Peter Whittle and Michael Borissow (The Angley Book Company Ltd., Maidstone, Kent; 191 pp.; illustrated; 21s.).

This book is dedicated to all those past and present men of the Search and Rescue Squadrons of the Royal Air Force—both air and ground crews—without whose constant vigilance, courage and determination the lives of so many in danger would have been lost. The stories it tells are of a war that the R.A.F. continues to fight and win daily—a war against fire, water, disaster in a variety of shapes and forms, unpredictable and with only one common factor—that every call upon the services of the men involved will test their skill and endurance to the limit.

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We take for granted nowadays the yellow-painted helicopters which patrol our coasts, hauling half-drowned swimmers from the waters off our Summer beaches, snatching survivors from sinking ships and a capsized oil rig named *Sea Gem*. We give no second thought to the brief announcement on the radio or TV that another crewman has been awarded the G.M. or A.F.M. for a particularly hazardous rescue. For that reason, one can only hope that this book will receive the widest possible readership, for it tells graphically and superbly something of what is involved in modern air-sea rescue work.

The reader can imagine himself on the end of a cable, swinging from a hoist on a helicopter, with waves 35 ft. high lapping at his heels, knowing that within minutes he will have to submerge into the raging watery inferno beneath on four separate occasions to try to fish out the crew of a sinking yacht whose only hope is to dive overboard and catch his outstretched arm.

We can take an imaginary ride in the cabin of another helicopter, alongside a nurse busily making up a mattress bed for a road crash victim who must be rushed to hospital. Not a very exciting situation? Unfortunately, it is not improved by the weather, which is so thick that the pilot can only inch his way along, wheels almost skimming the oily waters of the Thames until it is time to turn inland. Then, there is a sudden lurch as the pilot turns violently to avoid a block of flats that looms ahead. "That would have been a bit of a chopper-stopper" is the only comment from the navigator.

In a lighter vein, the authors record how an idea conceived by a pilot "while playing with a nailbrush in the bath" helped to save two lives.

Let those, particularly, who regard the R.A.F. as an expensive, outdated luxury read this book. Would anyone but a man trained by such a Service be able and willing to face daily the dangers against which the members of the Air-Sea Rescue squadrons battle? While paying tribute to these men, let us also remember that we all owe our lives to the deterrent power of the R.A.F. as a whole throughout these troubled post-war years. J.W.R.T.

Qantas Rising, by Sir Hudson Fysh (Angus & Robertson, London; 296 pp.; illustrated; 45s.).

It is astonishing how many of the world's great airlines owe their existence to the foresight and persistence of one or two men. Australia's great overseas airline Qantas is an outstanding example.

Back in the early post-war (1914-18 vintage) years, a young ex-military pilot named Hudson Fysh piled into a Ford "Tin Lizzie" with P. J. McGinness, and made an epic journey across the untravelled deserts and creeks of the Australian Northern Territory in search of suitable landing sites for pilots who were about to attempt the first flights from Britain to Australia.

Soon afterwards, over a glass-topped round table in the lounge of the Gresham Hotel, Brisbane, the same two men worked out with friends the details of a new airline which they hoped to form as the Queensland and Northern Territory Aerial Services Ltd., or Qantas for short. At least one of the graziers who wrote out a cheque to help get the operation off the ground inscribed "donation" on the cheque-butt. There seemed little hope that the shares he had bought would ever produce any return, but he felt it his patriotic duty to help the returned ex-servicemen who were willing to try to open up the country by air.

Needless to say, the venture had to surmount immense difficulties in the early twenties. The only aircraft available at first were ex-military machines and makeshift post-war conversions. Sir Hudson Fysh, in this autobiography of his own life and that of Qantas up to 1935, recalls particularly a triplane conversion of the Avro 504. Far from inheriting the superb qualities of the original, "when coming out of a left-hand turn even with full right rudder the aeroplane kept on turning before it could be gradually induced back again on a straight course."

Other equipment was just as primitive—not least the old felt hat through which petrol was sometimes strained when a chamois leather was not available. It was also necessary to appoint a nightwatchman in certain places, to keep away souvenir hunters and wandering cows and horses which had a habit of chewing wingtips.

Anyone who has met Sir Hudson Fysh will know what to expect in his book—a blend of forthrightness, honesty, humour and hard business sense. It makes inspiring reading, and one is left with the feeling that airlines would be much better nowadays if they were run by a few more Hudson Fyshes and a few less financial wizards and government-appointed puppets.

J.W.R.T.

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The Powerless Ones, by Michael Cumming (Muller Ltd., London; 240 pp.; illustrated; 30s.).

It is not quite true to describe this as a history of gliding. Its ten chapters are each self-contained descriptions of a single incident or application of gliding, linked by brief inter-chapter notes. The result is a very readable and interesting collection of stories that give a glimpse of what gliding has achieved in half a century, written in the style of a journalist rather than a historian.

This accounts for Mr. Cumming's choice of subjects. One chapter, for example, is devoted to the story of the Hadrian glider *Voo-Doo* which was towed 3,200 miles from Montreal to Prestwick, across the Atlantic, in 1943. This was no more than a stunt, and the Colditz Cock, built by prisoners-of-war in Colditz Castle, Germany, as a potential means of escape in 1944, hardly played a major part in the story of powerless flight.

Nevertheless, this does not in any way lessen the interest of *The Powerless Ones* as a story book. Too many reviewers seem to assume nowadays that readers want only a collection of facts, completely comprehensive and clinically precise. In fact, the majority probably prefer a good story, well told, and that is what they get in Mr. Cumming's book. It is incredible to think that a group of prisoners, cut off from all supplies of normal aircraft materials and under the scrutiny of their guards, should have been able to build such a machine as the Colditz Cock; and it is seldom possible to measure the worth of human achievement purely in terms of what it contributed to technological or social development. One climbs "Everests" because they are there, as a challenge to courage, endurance and skill. History would be dull if Alfred's cakes and Bruce's spider were not mixed in with more solid and significant data, and future historians of motorless flight will be glad to have tales of the kind that appear in this book with which to leaven the basic raw materials of their works. J.W.R.T.

The Fighters — The Men and Machines of the First Air War. By Thomas R. Funderburk. (Arthur Baker, London; 8½" x 11"; 195 pp.; 100 illustrations and 91 line drawings of aircraft; 45/- net).

"THE FIGHTERS" records the birth and development of fighting in the air from its earliest days to the end of the First World War. Most interesting are the detailed descriptions of the fighter aircraft flown by the combatants of both sides and biographical notes of the outstanding British, French, American, Canadian and German fighter pilots; many of whose air combats are realistically described.

The author has obviously taken considerable trouble to get his facts right by painstaking research, no easy task when recording so much detail of the events of more than half a century ago. Those still living who participated in the air battles of 1914-1918 may here and there find facts and conclusions which differ from their recollections of these events, but will find that the author has been surprisingly accurate. Small errors can easily be forgiven, such as quoting Major Hawker's V.C. of 24/8/1915 as the first V.C. awarded in the R.F.C. (Rhodes-Moorhouses's was 22/4/15 and Warnefords 25/7/15). Perhaps to describe the American George Vaughan, who had 6 victories with the British Air Force before subsequently transferring to the U.S.A.F. and with them shooting down 7 more, as an "Ace" of the R.A.F. and U.S.A.F. is an overstatement when compared with Ball's 44 victories with the R.F.C.; but after all how many victories do constitute an "Ace?"

It is most refreshing to read a war book written by an American with such absence of national bias.

Readers of the "R.A.F. QUARTERLY" interested in the early history of their Service, will already be familiar with much contained in the biographical notes on British fighter pilots and British aircraft, but this book now provides them with an interesting exercise in comparing these with the hitherto unknown details of fighter pilots and aircraft of France and Germany.

This book with its extensive coverage of the air battles of the First World War, the varied capabilities of the aircraft of that period so very generously supported by excellent illustrations and line drawings, provides vastly interesting and enjoyable reading. It will occasion many nostalgic memories to be revived among the over seventies. A.H.S.

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Salute The Soldier. By Captain Eric Busn, R.N. (Allen & Unwin, London; 435 pp.; 52/6 net).

This anthology of quotations, poems and prose by a senior naval officer is a fine example of the basic bond and understanding between fighting men of our Defence Forces, which transcends the professional rivalries between the three Services. This book is a great tribute to the resourcefulness and courage of the British soldier throughout the centuries.

During his long and distinguished career Captain Bush has seen the British soldier in action at Gallipoli, on "D-Day" and at the landing on the Arakan coast. Ranging widely from the Civil Wars to the onslaught on Japan, he links the periods with brief notes, thereby maintaining skilfully the sequence of events.

His account of "The Charge of the Light Brigade," with all its tragedy and inspiring traditions, will once again stir memories with its gallantry and horrors.

The Indian Mutiny extols again the endurance, tenacity and greatness of the British soldier in the face of overwhelming odds, who has suffered so many disasters, won so many victories, that neither the one or the other unduly depresses or elates him. Come what may, he holds his inflexible confidence in ultimate victory.

Those disillusioned by current affairs should not despair. So often do we hear that "History Repeats Itself," which is depressing enough, but although this excellent book describes equally if not worse periods, it recounts how we rise again to greatness when the occasion demands.

Nothing quite like it has been published before of the great feats of the British Army, its leaders and men, from Cromwell to Churchill, through the battles of Marlborough, Wolfe, Abercromby and Wellington through the Afghan and Crimean Wars, the Indian Mutiny, the China, Zulu and Boer Wars and, to a greater extent the two World Wars.

This is indeed a fascinating book in which young and old alike will find inspiration in the imperishable deeds of our British soldiers. *"SALUTE THE SOLDIER" is a companion volume to Captain Bush's naval anthology "THE FLOWERS OF THE SEA" and these inspiring histories of the outstanding qualities of British fighting men, makes one hope that he will one day complete the series by an anthology of our airmen, for which there is plenty of material.*

A.H.S.

The Military Intellectuals in Britain. By Robert Higham. (Rutgers University Press, New Brunswick; 267 pp.; $7.50).

This book includes selected extracts from the views of a number of military intellectuals and the background of some of them. These are interspersed with the opinions and conclusions of the author. It is, in consequence of the disagreement of views on military affairs held by these military intellectuals, a most controversial book. Even more controversy will be aroused by the views and opinions of the author when his book is discussed in Service circles, particularly in the Royal Air Force.

In the days after the First World War he says — "The Air Power People largely succeeded in scaring the country, not into creating a credible deterrent, but into believing that they would be the victim of a knockout blow." Furthermore he places the blame for the inadequate strength of the Royal Air Force at the time of Munich upon the Air Ministry and not, as anyone in that Service knows, upon the Government of the day.

All such disputable opinions concerning the R.A.F. cannot be quoted in a brief review, but one other astounding assertion cannot be left out. He says: ". . . as has since become patent, the air power disciples were taking Britain on the road to potential disaster."

On closing this book the impression of many must be that the author has been less than fair to those who were the architects of The Royal Air Force and those who guided it to its achievements in "Their Finest Hour," yet he leans over backwards to extol some of the military experts of the Navy and Army.

Those who knew the late Viscount Trenchard personally for more than 40 years, served with him throughout the First World War and through the period when he built-up the Royal Air Force in most difficult times and against the strongest opposition, will discount the attempts by any would be historian to belittle all this great man did for the R.A.F. and Britain.

A.H.S.

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Farewell to Arabia. By David Holden. (Faber & Faber, London; 17 illustrations and 3 maps; 35/- net).

This book gives a fascinating account of the undeveloped Arabia of byegone days and traces the gradual changes, becoming swifter in the last decade, until reaching the uneasy situation of today.

It is a masterly description of Arabs, their vast country and the political influences on their development, supported by 17 excellent full page photographs, taken by the author, 3 maps and a helpful Index.

Particularly interesting and instructive are the events of the past ten years, culminating in the British Government's announcement in February, 1966, that it would abandon the Aden military base in 1968.

A.H.S.

Rehabilitation of the Hand. (Second Edition). By C. B. Wynn Parry. (Butterworth, London; 367 pp.; 230 illustrations; 92/6 net).

An outstanding book which deals exhaustively with the treatment and aftercare of the hand in every kind of disability, whether due to injury, deformity or disease.

The author has had vast experience in this kind of work in the Royal Air Force rehabilitation units, and this book reflects the methods used there.

The second edition has been extensively revised and in particular the sections of functional anatomy of the intrinsic muscles, treatment of hemiplegia, physiotherapy techniques and the manufacture of splints has been rewritten. New sections have been added on sensory re-education, prostheses for amputations, conduction velocity measurements in localising peripheral nerve lesions, lively stretch splints and games for the re-education of hand function. Problems of resettlement, vocational guidance and economics are also discussed.

A.H.S.

The Norwegian Campaign of 1940. By J. L. Moulton. (Eyre and Spottiswoode, London; 328 pp.; 15 illustrations and 20 maps; 55/- net).

From military failures, such as the Norwegian Campaign of 1940 in which all three elements of sea, land and air were fully involved, there is much to be learnt; particularly when it is reviewed in the greatest detail by a military expert such as Major-General Moulton.

After a most successful military career for 40 years, he retired in 1961. During this service he held such high appointments as "Chief of Combined Operations in Peace" and "Chief of Amphibious Warfare." Possessing expert knowledge of all the technical factors he sets out in this book his views in a very well-balanced piece of re-thinking.

He describes how and why this Campaign failed and offers a few well-argued proposals of his own as to how, even if victory was not possible, we might at least have achieved greater results, which would have been more damaging to Hitler's self-confidence and prestige as a war leader. Readers may find some scepticism in this book, but in comparison there is much more that is constructive.

The mistakes made at the outset by Service Chiefs and Political Leaders, who thought and planned in a convention of separate strategies, the half-organised resistance to the German offensive, the mismanaged arrival of the British land forces, the reasons for the ineffectiveness of the air defence and why the Germans could not have been other than victorious are all set out with a force and clarity that give the author's obvious professional expertise a crisp and decisive impact.

His comparison in considerable detail of this campaign with the bitter struggle between Americans and Japanese over the island of Guadolcanal in 1942 provides further study of the problems of limited war.

For the efficiency of combined operations, officers serving in our land, sea and air forces are encouraged to make a close study of the strategy of conventional warfare; to the recommended list of reading for such study this book would make a useful addition.

A.H.S.

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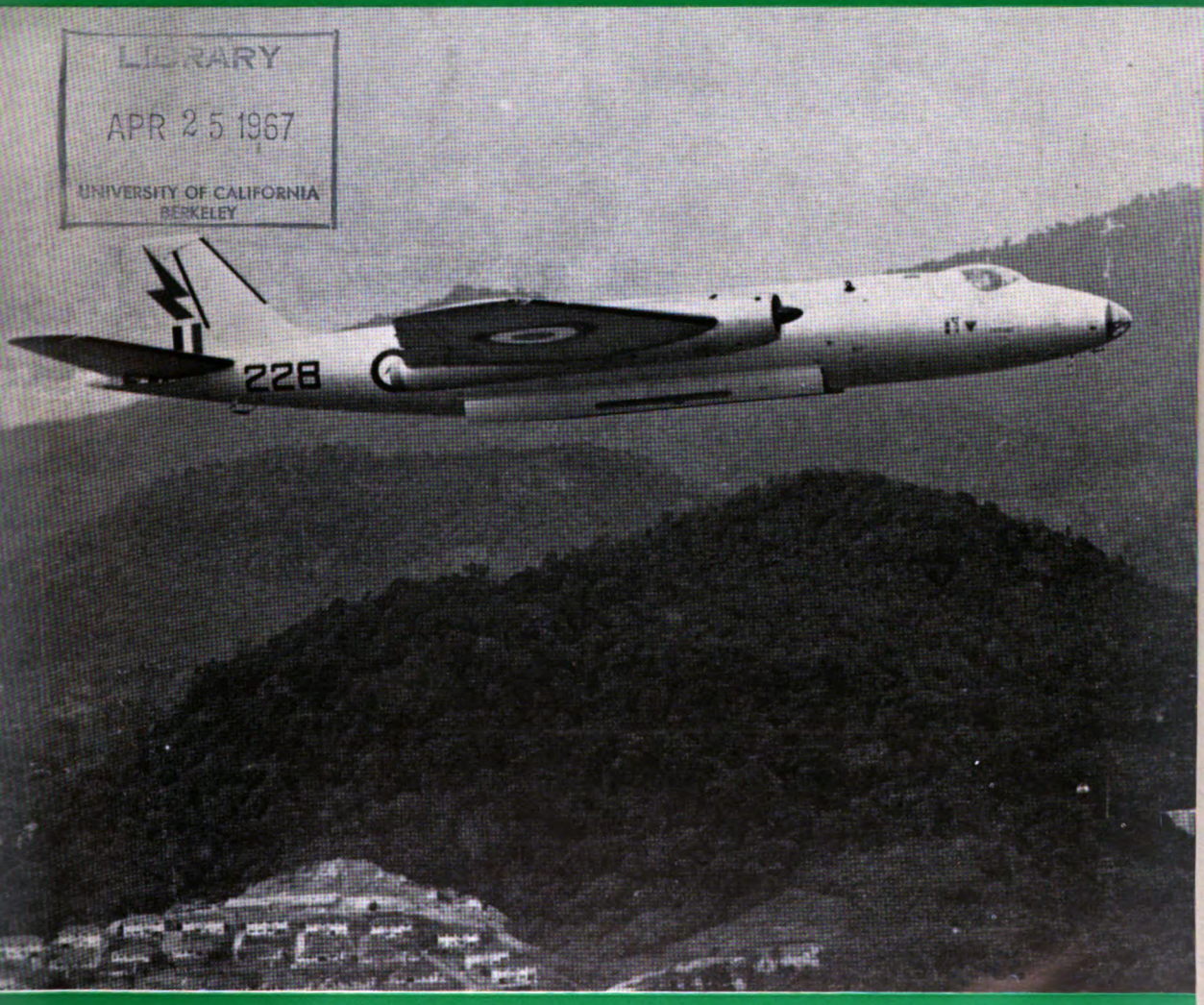

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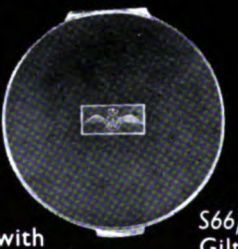

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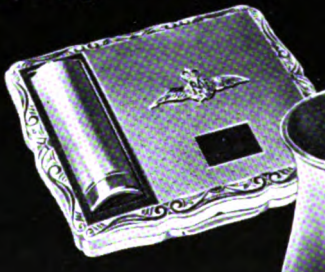

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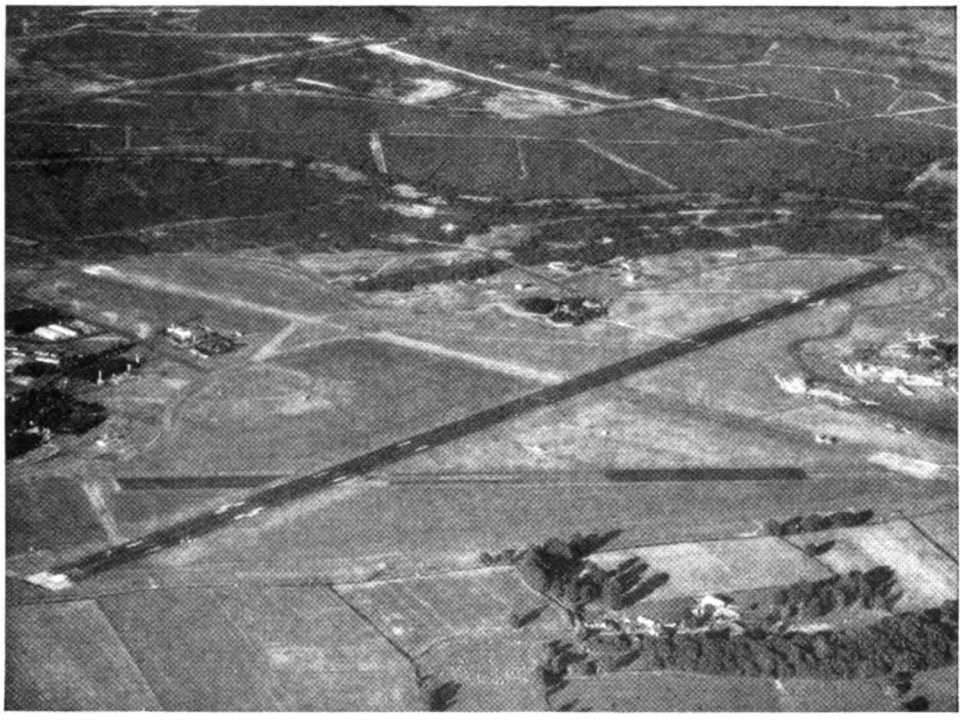

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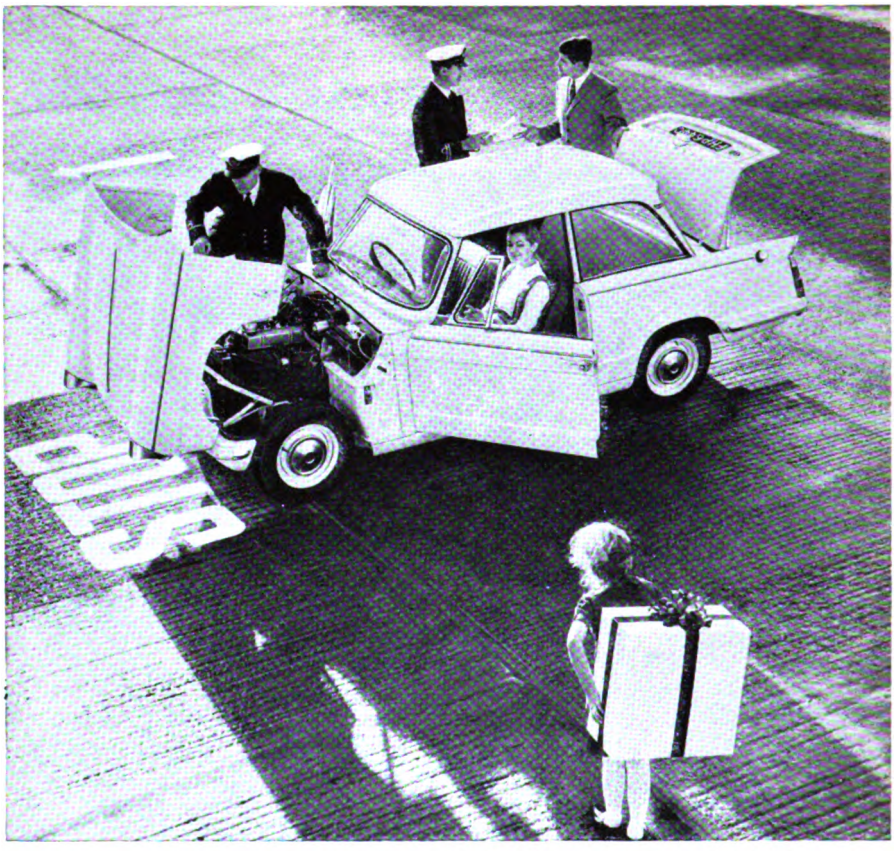

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(INCORPORATING THE JOURNAL "AIR POWER")

Volume 7 SPRING 1967 No. 1

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GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RETD.)

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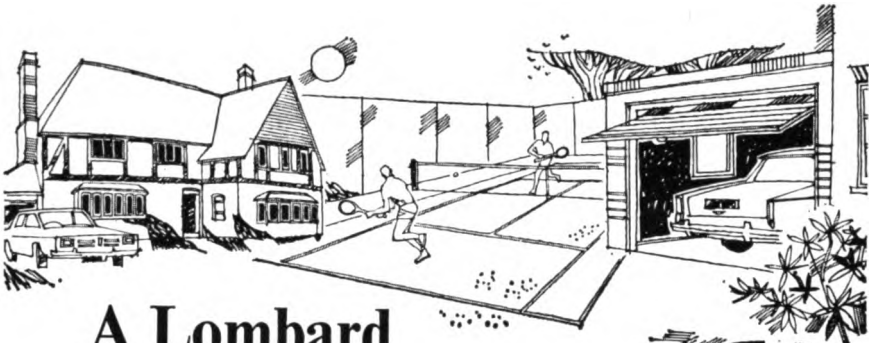

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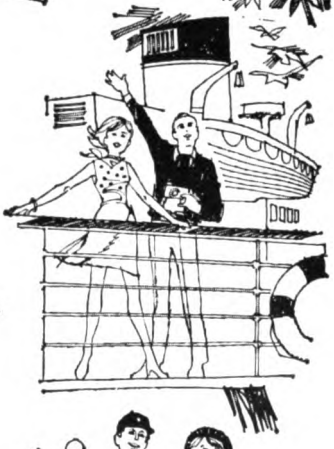

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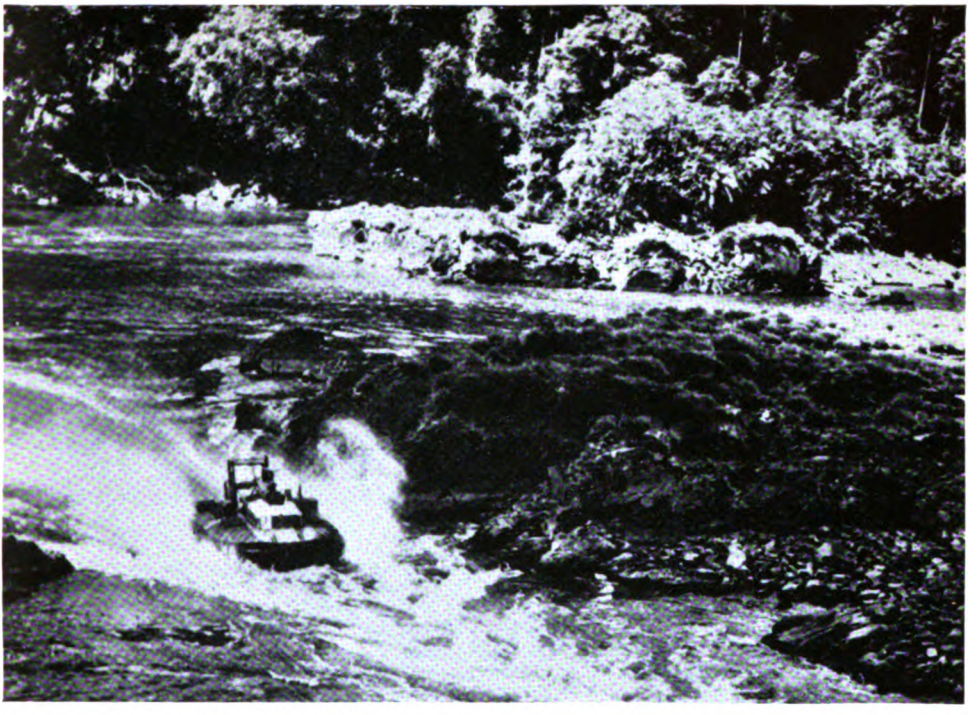

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The F-4K Phantom has been ordered for the Royal Air Force with the first flight scheduled for 1967.

(*see article "Does Britain Need an Air Force" page 9*)

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ASIA: THE DREAM AND THE AWAKENING

By Dr. C. L. Wayper, M.A., PH.D.

Dr. Wayper graduated at Cambridge University and took his doctorate there. On leaving the Army he returned to Cambridge where he is now Director of Studies in History and Fellow of Fitzwilliam College and James Stuart Lecturer for the Board of Extra-Mural Studies. He is the author of "Teach Yourself Political Thought" and has contributed articles to various journals and festschrift on International Affairs.

GREAT hope and great competition characterised the first phase of Asia's post-war development. The hope was that politicians as well as playwrights could turn the accomplishment of many years into an hour glass so that within a single generation Asians would find for themselves a prosperity and a power which would rival that of the great. The competition was between the Chinese communist and the Indian democratic way of fulfilling the great hopes. Yet today as the frenzy of China's Red Guard grows and India prepares for the next General Election the hopes have clearly not been fulfilled and the competition between different ways of building the brave new world has become little more than competition to avoid collapse.

China has now recovered sufficiently from the disasters of the Great Leap Forward, the expensive eccentricities of the Commune and the malevolence of nature to take her next step along the road to communism, the Cultural Revolution championed by the Red Guards. She has, however, already underlined the old truth that while the speed of the hare is impressive its average time over the course when many things hold it up is not. Politically, too, her success is not what it once seemed to be and whereas yesterday great expectations filled her mind today it is on great problems that her attention is fixed. She is facing what she calls "the cadre problem", the problem of the stupidity, the fanaticism and even the downright dishonesty of the local agents who implement her policies, the problem of the peasants whom she considers to be the most unreliable of revolutionaries although it is still on their sinews that the future depends, the problem of the intellectuals whose service she needs but who can be kept in the straight and narrow way only by constant purges, the problem of the educated youth to whose care she must one day entrust the great revolutionary banner but who were "unsteeled" in the great revolutionary days and whose revolutionary zeal has been so markedly lacking as to cast doubts upon their building in the future an undefiléd heritage. Moreover she is facing these problems with bitterly divided councils, Mao and Lin Piao determined to trust in revolutionary zeal, in youthful extremists rendered to the more fanatical by their mob activities and in the support of the army, Lin Shao-chi, however, resolved not to expose China

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again to the catastrophe of the Great Leap Forward, commanding the Party machine, many workers and possibly soldiers too. The issue being far from settled China, like 20th c. man in Max Beerbohm's cartoon, is left gazing into a future in which a great question mark has replaced the towers of the Golden City which were once so clearly seen there.

So is India. Since she avoided the downward lurches, even if should could never emulate the great upward surges, that characterised China's development her own can probably stand comparison with it better than is often acknowledged. But she has suffered recent multiple misfortunes, the misfortune of the failure of the monsoon which threatened famine and harmed industry by reducing hydro-electric production, the misfortune of war which imposed a heavy financial strain and led to the suspension of western aid, the misfortune that renewed aid both falls short of what she wants and must be expected to continue to do so since donor countries, deterred by the size of her needs (they are expected to provide a quarter of the expenditure contemplated in her 4th plan) and alarmed at the inadequacy of her government, are thinking less of the necessity of not allowing the vast sums already invested to be wasted than of the desirability of not pouring good money after bad. Politically, too, India today has more reason for anxiety than for hope. Her government has proved unable to give a clear lead, to get things done, to eradicate corruption. It has failed to keep politics political, having, as Nehru's words "All this satyagraha business—everybody wants to fast for something" and as the widespread disorder in India today and the increasing instances of fasts unto death and other forms of political suicide there show, reaped a bitter harvest from Gandhi's teaching on passive resistance. It has failed to maintain its own party unity and has thus weakened itself at the very moment when the 16 states have by identifying themselves with dominant regional languages grown so dangerously strong that secessionist movements have acquired a new and sinister significance. All this being so Indians may well wonder "Where is it now, the glory and the dream?"

Two things, it is beginning to appear, will also characterise the second phase, now opening, of post-war Asia's development, the shedding of illusion and the avoidance of vast imbalance. Both will be important. The shedding of the illusion that it is possible to produce overnight the wealth and the might that goes with great industrial power, the realisation that politics is the art of the possible, will profit us all and make Asia a more stable place since ceasing to insist on the things that are beyond one's power to attain is the first step along the road to domestic and international sanity. So, too, will avoidance of the vast imbalance that would have resulted had either China or India alone decisively broken through to great powerdom untrammelled by the weaknesses and the problems which still check them, imbalance of the sort that Japanese power could not have redressed, for imbalanced power of this kind tempts states to dangerous courses. This does not, unfortunately, mean that Asia will cease to trouble either itself or the world for it lacks the stabilisers that are now an integral part of the European scene. It should, nevertheless, prove easier to live with an Asia that has rid itself of one dangerous delusion and that has not acquired such an explosive imbalance of power as might have resulted from the great competition that, together with the great illusion, characterised Asia in the heady independence days.

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DOES BRITAIN NEED AN AIR FORCE?

By John W. R. Taylor, F.R.HIST.S., A.R.AE.S.

John W. R. Taylor from 1941 to 1947 was on the design staff of Hawker Aircraft: from then until 1955 was Fairey's Technical Publicity Officer. Since 1956 Editor of "AIR BP"; Assistant Editor of "JANE'S ALL THE WORLD'S AIRCRAFT" until appointed its Editor in 1959. Author of 119 books on aviation, which included "The History of C.F.S." for which he was awarded the C. P. Robertson Memorial Trophy in 1959. He has been a regular contributor of articles for many years to the ROYAL AIR FORCES QUARTERLY as well as to all the best known aviation journals.

BEFORE attempting to answer the question posed by the title to this article, we must be certain of what we mean by an "air force". There are quite a number of sovereign states in Africa which have air forces consisting of one or two Dakotas and a few light liaison aircraft doled out to them by their former overlords. Main duty of the force is to provide VIP transport for the head of state and his entourage during their (often very temporary) period of office.

Clearly, this is not what we mean by an air force for Britain.

At the other extreme we have the United States Air Force, with some 15,000 aircraft, made up of everything from piston-engined trainers to intercontinental nuclear bombers, backed up by equally powerful naval and army air forces, and long-range missiles.

This may be the kind of air force we should like to see in Britain, but it is out of the question economically and no longer necessary in relation to our commitments.

Somewhere in between are two practicable but very different air forces—the one we need and the one that Parliament believes we can afford. The latter is of no value strategically, of limited use tactically and, hence, a complete waste of money. It could even be dangerous, as a nation which believes itself to be strong, when it is in fact weak, may involve itself voluntarily in a situation with which it cannot cope. It is the kind of situation that confronted the French in 1939, as they sat smugly behind their Maginot Line, and which led to such tragic consequences in 1940.

Britain would be better with no air force at all than with one that is large enough, or efficient enough, only to begin a campaign, without the resources or capability of seeing it through to the end. The Royal Air Force now planned, with about the same number of combat aircraft as the Swedish Air Force, could never undertake a prolonged campaign against any but the most poorly-equipped and friendless enemy. Is it therefore, worthwhile continuing to spend £2,000 million a year on a totally inadequate defence system? If we cancelled our forthcoming American-built F-111K's and Phantoms, many more of the dollars we earn the hard way by selling

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BAC One-Eleven airliners to America would be available for cultural masterpieces such as "Batman".

This is being cynical: but why should not those of us who retain a pride in Britain and its air force be cynical—and angry? Little Sweden, jealous of its tradition of neutrality, and willing to make sacrifices to maintain it, works out the most economical defence system that will guarantee survival against anything but an all-out nuclear attack by a powerful neighbour (against which unlikely probability it knows there could be no defence). Having conceived the optimum system, at a cost which is still quite frightening, it begins creating it—so far as possible within its own resources.

What a deplorable, depressing contrast is offered by our own current defence planning—or lack of planning. Never has any nation spent so much, to so little effect, without apparently learning a single lesson.

A decade ago, the Royal Air Force still shielded the West against any and *every* form of aggression. The might of Bomber Command was indisputable. The V-bomber force was beginning to take shape in a form that would enable its commander to state, eventually, that it could wipe out almost all worthwhile targets in the Soviet Union by itself. There were no doubts of this. The quality of the aircraft, their weapons, their countermeasures equipment and the men who flew them guaranteed it. No other bombers in the world matched the capability of the V-bombers; no other weapons of mass destruction offered their flexibility and discrimination.

Unfortunately, that year of 1957 was of sinister significance. It was the year when defence degenerated into a toy of party politics. The strategy of defence in a nuclear age was beyond the understanding of the man in the street. It was easy to incite ban-the-bomb campaigns, because everyone knew what atomic bombs could inflict on people and cities. Why bother to make people think about the far more ghastly biological and bacteriological weapons that also existed — and would continue to exist if atomic bombs were banned? Why expect them to weigh up the chances of the small-population west against the massively-populated east in an old-fashioned war of men and machines, with the deterrent protection of "the bomb" removed?

But, of course, there was no question of dispensing with "the bomb" in 1957—even if millions of pounds were to be spent hypocritically on maintaining a permanent nuclear disarmament meeting session in Switzerland. It was only the manned elements of air power that were to be superseded. As the Plowden Committee's Report summed it up later: "The rocket and the guided missile were expected largely to take the place of manned aircraft, save for transport aircraft, helicopters and a Canberra replacement."

Looking back at Duncan Sandy's infamous White Paper on Defence, published in April, 1957, one reads: "In view of the good progress already made (with surface-to-air missiles), the Government have come to the conclusion that the R.A.F. are unlikely to have a requirement for fighter aircraft of types more advanced than the supersonic P.1 (Lightning), and work on such projects will stop." Yet, today, we have

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at least four new types of fighter either in production or under development for the R.A.F., made up of the Hawker Siddeley P.1127, Anglo-French Jaguar and variable-geometry fighters and American-built McDonnell F-4M Phantom II.

The record of ten years of shilly-shallying and skulduggery in relation to offensive aircraft is even worse. The 1957 White Paper commented that: "Having regard to the high performances and potentialities of the Vulcan and Victor medium bombers and the likely progress of ballistic rockets and missile defence, the Government have decided not to go on with the development of a supersonic manned bomber, which could not be brought into service in much under ten years."

Now that those ten years are up, it is interesting to see what we have in place of the supersonic bomber that would by now have been in service. Of course, we do still have the Vulcan and Victor, but where are all the ballistic rockets and missiles?

Sixty Thor intermediate-range ballistic missiles, with nuclear warheads, were supplied to Bomber Command from America, and began to supplement the V-bombers in 1958. But by 1963 they were all on their way back across the Atlantic, being as obsolete as the dodo. Even in 1957, however, the Thor was probably regarded as only an interimweapon. For two years, de Havilland had been working in secret on the far more formidable all-British Blue Streak rocket, able to carry a much more powerful warhead over much longer ranges. Unfortunately, it was soon clear that Blue Streak also was an outmoded concept, too vulnerable to surprise attack to be of any great value as a deterrent. In April, 1960, Blue Streak was abandoned as a military weapon, after £84 million had been spent on it.

Instead, it was decided to utilise a different kind of ballistic missile—the American-designed air-launched Skybolt, which was to be carried by Vulcan bombers. But the by-now-familiar pattern was soon repeated; in December, 1962, Skybolt joined the military Blue Streak on the scrap-heap, because America no longer wanted it and Britain considered that the cost of developing it alone would be too great. Two years of wasted effort had cost the British taxpayer a further £27 million, with nothing to show for it.

Seldom has a worse decision been made. Only the protagonists of the ballistic missile, as opposed to manned aircraft, salvaged something from the Anglo-American meeting that killed Skybolt. In its place, Britain began planning for a force—if that be the right word—of four nuclear-powered submarines, each armed with 16 Polaris nuclear-armed ballistic missiles.

Extravagant claims were made for these Polaris submarines. They would be able to cruise over 70% of earth's surface, beyond any possibility of detection, and launch their missiles while still submerged. Only two would be on patrol at any given time, giving a first-line strength of 32 missiles—but this would be more than sufficient to maintain Britain's position as a nuclear power.

Suggestions that the submarines might not be undetectable, and the Polaris missiles infallible, by the time the first of the vessels became operational in 1968 were met with smug accusations of prejudice and allegations that the critics were only jealous at the thought of sea power once again becoming more important than air power.

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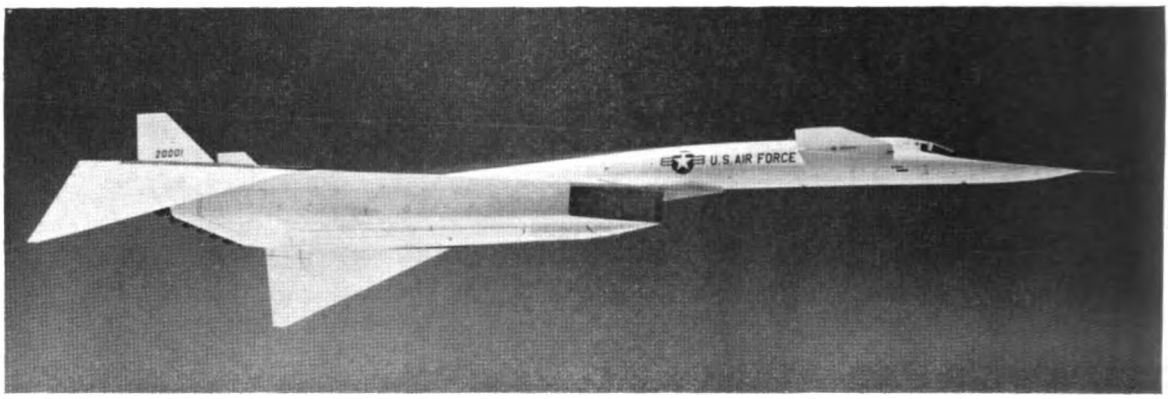

Largest and fastest bomber ever flown is the North American XB-70A Valkyrie, which can cruise continuously at Mach 3, above 70,000 ft. An even-faster bomber, armed with advanced Skybolt-type air-launched missiles, might form a far more effective deterrent in the 1970s than any Polaris submarine fleet. Just two eight-plane squadrons of such aircraft, armed with four missiles apiece, would carry the same number of weapons as the Royal Navy's Polaris force, with far more likelihood of penetrating to the targets.

Gone, but not forgotten! The incomparable TSR.2, which—despite any loss of face it would ***entail—should*** *be put back into production immediately. It would save money, enable the RAF of the 1970s to* ***be the best-equipped*** *tactical air force in the world—and might even earn a great deal of dollars when the USAF* ***awakened to the fact*** *that it had nothing to match it.*

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Nevertheless, close study of the Defence Estimates published in February, 1966, reveals the revised claim that the Polaris submarines "will be *almost* impossible to detect." Generations of experience in war ought to warn us that there is little difference between "almost impossible" and "almost certain". Even worse, Russian progress in creating an anti-missile defence system has already persuaded the Americans that Polaris may soon be incapable of penetrating to its target. They intend to switch largely to the more sophisticated Poseidon, which will have multiple warheads to present more of a problem for the anti-missile missiles.

So, after ten years, and the expenditure of immense sums of money, Britain has a grand total of no operational ballistic missiles to supplement its front-line force of 100 or so Vulcans and Victors. Instead of decrying these superb aircraft which, with their Blue Steel nuclear-armed air-to-surface missiles, remain a very viable deterrent, the press and public should be concentrating their criticism against those responsible for a decade of costly mismanagement and technical incompetance.

To complete the gloomy picture, we have the case of the one new combat aeroplane that was considered essential in 1957—the Canberra replacement. This materialised in due course as the TSR.2—perhaps the most brilliant military aeroplane yet conceived and developed to the point of practicability by any nation. The whole sad story is too fresh in our memories to need recording here; but British air power—perhaps even Britain's last hope of remaining a major independent military power—died with the TSR.2 airframes and jigs that were ordered to be smashed to pieces to prevent their being resurrected by anyone with sufficient sense to recognise their worth.

Even Hitler had less success in trying to obliterate British aviation than we have had ourselves in recent years. Our aircraft industry has been merged, mutilated and messed about so much that it is reckoned an achievement to have delivered a *total* of fewer than 150 civil aircraft and helicopters to overseas customers last year. Two of them were, admittedly, Super VC10s costing more than £2 million each; but it is a sobering thought that one American company, Cessna, built 3,000 of its 1966 Model 150 light aircraft alone, while Boeing sold more than 400 jet airliners in a recent twelve-month period—including 53 "jumbo jets" that will, by themselves, cost a total sum nearly twice as great as the export earnings of the entire British aircraft industry in 1966.

Nor is it only the industry that has suffered. The Air Ministry disappeared long ago. Now the Ministry of Aviation has followed, its components being scattered along the corridors of the Board of Trade, Ministry of Technology and elsewhere. One is almost forced to conclude that the very words "air" and "aviation" are an anathema in government circles.

To what can the Royal Air Force look forward?

Most exciting of the aircraft with which it is to be re-equipped is the Hawker Siddeley P.1127 V/STOL close-support, strike and reconnaissance aircraft, of which 60 are expected to be ordered, plus ten two-seat training models. What the French call the *malaise anglaise* is reflected in the fact that the P.1127 design was initiated

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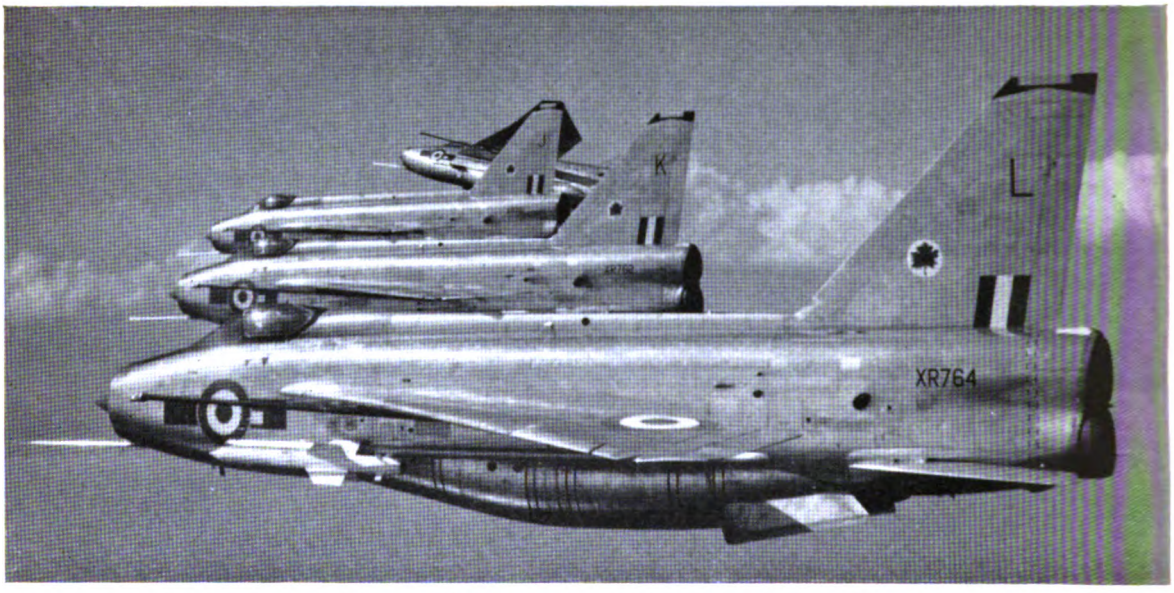
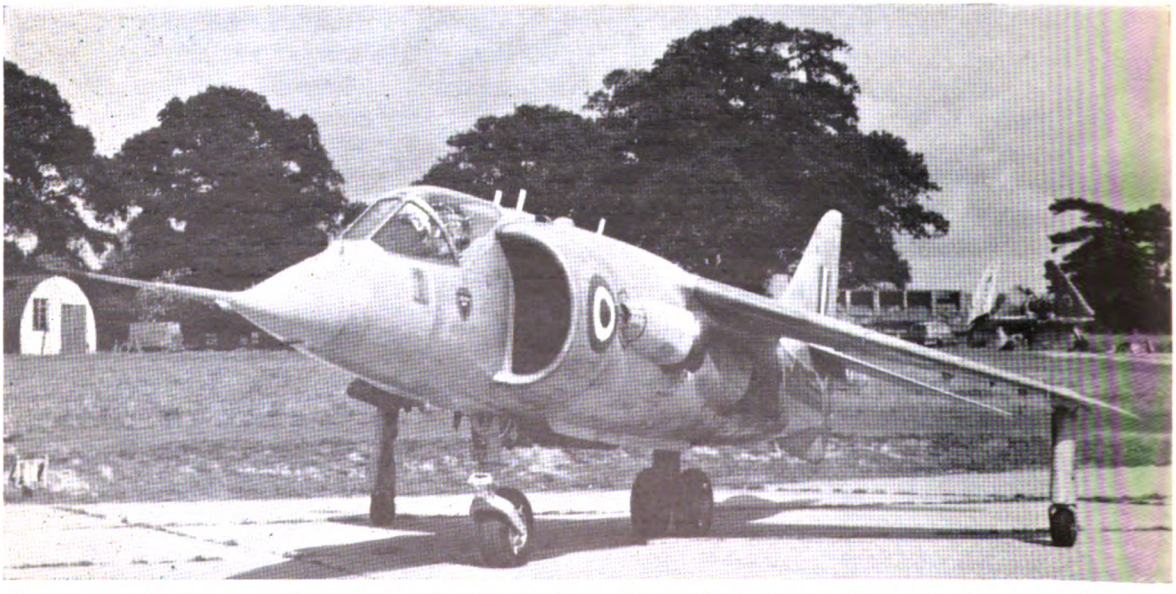


Having persuaded the Saudi Arabians and Kuwaitis to buy Lightnings—presumably as the best available aircraft —we now proclaim that we intend to replace Fighter Command's Lightnings with Phantoms in the 'seventies. Why?



First pre-production example of the developed P.1127 for the RAF. If, as is reported, this aircraft will be used only as a conventional fighter, without exploiting its V/STOL capabilities to the full, we shall be guilty of yet another tragic waste of money and genius.

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ten years ago, in 1957. In its latest, developed form, it is much improved, even by comparison with the pre-production P.1127s evaluated in 1965 by a joint British-American-German squadron based at West Raynham. But it will never be as operationally effective as the more advanced, supersonic P.1154 that was cancelled by the incoming Socialist government early in 1965. Nor, without the simultaneously-cancelled HS 681 transport, could the P.1127 ever live up to its inherent capability of being able to operate from jungle clearings, beaches, roads, or almost anywhere else accessible to a helicopter. A V/STOL fighter can only be kept in action when supported by V/STOL transports.

Not that disappearance of the HS 681 really seems to matter any longer. There is a growing belief that when the P.1127s become operational, in 1971 (!), they will be used only as conventional aircraft, using a moderate forward run for take-off and landing. It would be difficult to think of a more humiliating rôle for the last world-beating product of the greatest fighter designed of all time—the late Sir Sydney Camm. All credit to the Air League for continuing to emphasise the potential of small aircraft carriers equipped with P.1127s—which would offer a solution to logistic support of the fighters—but how little chance there is that such ideas will be considered, let alone accepted.

The American-built Phantoms ordered for the R.A.F. and Royal Navy are formidable fighters; but they are very different from the "go-anywhere" P.1154 whose place they have taken. It is even more surprising to be told that they will, in the 'seventies, supersede the Lightning, as there are many who believe the Lightning to be the world's finest fighter—not least, one would imagine, the Saudi Arabians and Kuwaitis to whom we have recently sold it!

The Phantoms will be available to replace Lightnings when their own task is taken over by the Anglo-French Jaguar dual-purpose lightweight advanced trainer and tactical support aircraft. This promises to be a useful little machine, but light weight implies a fairly limited payload and its maximum speed of Mach 1.8 is modest even by comparison with such veteran types as the Soviet MiG-21. If its cost works out at only £500,000 apiece, as hoped, it will be an economical weapon for "police" actions, but it hardly looks like a first-line combat aircraft for a major air force.

With an estimated cost of £1½ million each, plus total research and development costs of around £200 million, the Anglo-French variable-geometry fighter (AFVG) is in a very different category. It is intended to replace the V-bombers when they finally become obsolete in the mid-seventies, and will supplement the R.A.F.'s F-111Ks, giving an all-"swing-wing" attack force.

One would like to be enthusiastic about such a force, especially as the Jaguar and AFVG programmes are helping to create close links between the British and French aircraft industries, which are vitally important to the future of both. But it cannot be repeated too often that joint programmes are worthwhile only when both partners get the aircraft they need. The AFVG is visualised as a smaller and more economical version of the F-111, with correspondingly reduced payload and performance. Will this be good enough for the 'seventies in view of the already-proven capability of

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early-type Soviet surface-to-air missiles against America's finest and fastest tactical combat aircraft in Vietnam?

Perhaps such thoughts are irrelevant. Seeing how many times Britain's defence policy and plans have changed in the past eight years, is it likely that the AFVG programme will survive the next eight years of vacillation?

One final thought on the subject *is* relevant.

According to our Prime Minister, the once-planned force of about 110 TSR.2s would have cost a maximum of £750 million, including research and development. This was, of course, far too much, and Mr. Wilson's colleagues assured us that cancellation of these aircraft would save us "hundreds of millions". Instead of TSR.2s we are to have about 75 F-111Ks at around £2¾ million apiece, giving a total of about £210 million; and about 150 AFVGs at (perhaps) £1½ million each, plus our share of the research and development charges, giving a total of about £325 million; to which must be added some £200 million for the TSR.2 programme and cancellation charges. The estimated grand total for a rather larger number of rather inferior aircraft is, therefore, around £735 million. So we don't really appear to be due for that saving of "hundreds of millions' 'after all. And, of course, we must now make a proportion of the payment in dollars, to the credit of the American industry, instead of in pounds to keep our own industry at work.

Little wonder that cancellation of the TSR.2 appears, in retrospect, to have been the most disastrous of a long series of costly mistakes by successive governments.

It is easy to criticise and to be cynical. Such an attitude is justified only if one has a constructive alternative to offer. Is there such an alternative today?

I believe there is, and that any loss of face involved would be preferable to the present likelihood of wasting countless millions of pounds on aircraft that will never be good enough to do the job that has to be done.

There has been no greater protagonist for Britain's rôle as a major nuclear power than the writer; but it may be that the time has come for a rethink. The possibility of all-out nuclear war, against the Soviet Union, is remote. In any case, nothing that Britain could do in the 'seventies, when the power of the V-bombers has waned, would be likely to prevent such a war or avoid annihilation of the United Kingdom if war came. The scale of our projected deterrent for the 'seventies is insignificant, either by itself or as a supplement to the American deterrent. This is particularly true in view of the diminishing potential of Polaris.

A government that was really interested in maintaining Britain as a major world power might well consider scrapping the Polaris fleet and the F-111K squadrons and diverting the money to research in the field of advanced manned aircraft. Even one or two squadrons of highly-supersonic long-range bombers, packed with counter-measures equipment and armed with advanced Skybolt-type missiles, fitted with multiple nuclear warheads, would form a very potent deterrent.

For the far more likely Vietnam-type campaigns of the future, the ideal would be a multiplication of the imaginative 38 Group concept of an integrated assault force, made up of troop-carrying and freight-carrying transports, backed up by helicopters

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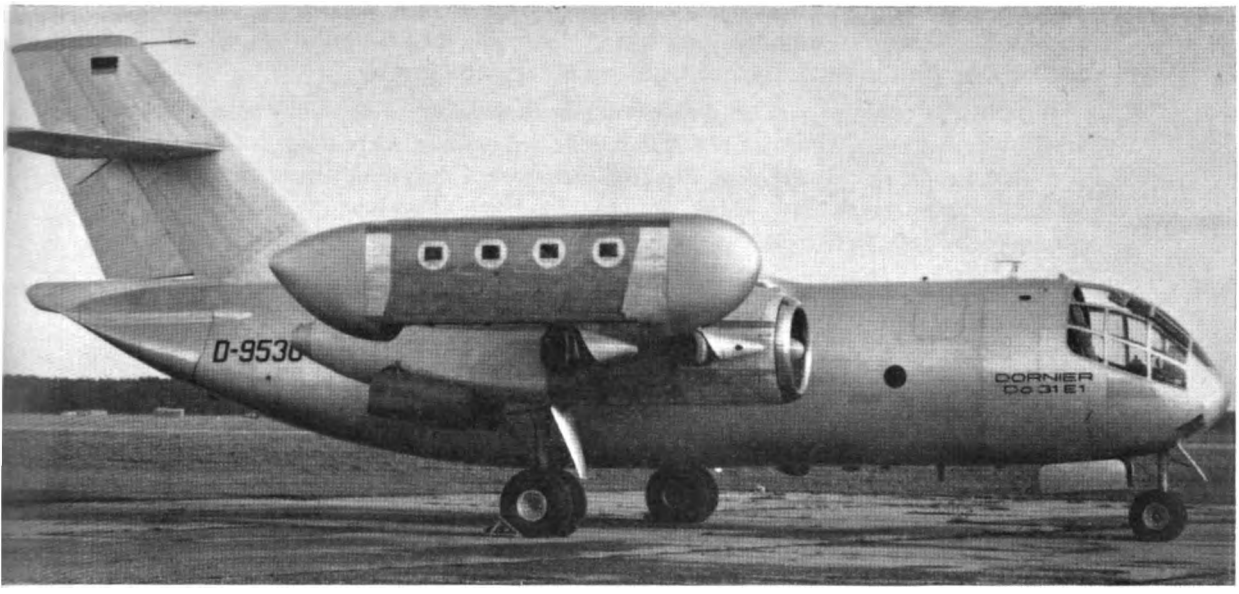

Britain collaborated with Germany in the early development of the Dornier Do 31 VTOL transport aircraft, then withdrew for economical reasons. Such a machine could help to give our tactical forces unrivalled mobility if backed up by a "go-anywhere" force of strike aircraft.

and supplemented by tactical combat aircraft.

The 66 C-130K Hercules transports currently being delivered from America would form satisfactory interim equipment for such a force, but much better for the future would be an Anglo-German V/STOL aircraft based on the Dornier Do 31, or an Anglo-Italian V/STOL version of the Fiat G.222. Tactical air forces of the 'seventies ought never to expect anything better than a rough 500-yard airstrip from which to operate.

If more money were put into the P.1127 programme, engine power and payload could be increased to the point where a heavy weight of weapons could be carried even after a vertical take-off. This unique aircraft would then be capable of providing fighter cover for the tactical transport squadrons. The Jaguar might also fit into the picture, providing the enemy defences were not too well equipped with surface-to-air missiles and zero-altitude radar warning systems.

The joint Anglo-French helicopter programme announced in January, 1967, should take care of this aspect of our ideal integrated "police" force for tactical campaigns. The 12/18-passenger SA 330 is already flying and promises to become a first-class 155-m.p.h. assault helicopter. Its smaller brother, the five-seat SA 340, inherits many components of the well-proven Alouette, and Westland can be relied upon to do a good job in developing the intermediate WG 13.

For initial strike and reconnaissance ahead of the assault force, the F-111K and AFVG could be used *faute de mieux;* but why not go for something better? In fact,

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why not resurrect the TSR.2? It would still be better than anything else planned for the 'seventies, and we might well end up by selling it to America—as we did its predecessor, the Canberra, because there was nothing comparable.

It would be a bitter pill for the government to swallow, as it would be a virtual admission that cancellation of the TSR.2 reflected political expediency rather than considered military opinion. But informed members of the public already know this, while the uninformed have short memories and are always happy when Britain produces the best of anything.

What a wonderful fillip this would give to our frustrated, brain-drained aircraft industry, as well as to the R.A.F. It would underline the leadership of British design, and surely it would not be asking too much of the French to join in the programme? Whatever we may like to think, the Jaguar, Concorde, SA 330 and SA 340 all started life as French projects: only the WG 13 was initially British. An Anglo-French TSR.2 would, to British eyes, restore the balance a little and make the *Entente* rather more *Cordiale*.

DELIVERY OF ARTICLES TO EDITOR

The *final dates* upon which articles must reach the Editor for inclusion in the Spring, Summer, Autumn and Winter numbers are: —

SPRING (MARCH)	22nd DECEMBER
SUMMER (JUNE)	25th MARCH
AUTUMN (SEPTEMBER)	24th JUNE
WINTER (DECEMBER)	23rd SEPTEMBER

It is sincerely hoped that contributors will not wait until the very last day before dispatching their articles to the Editor, as this can seriously disorganize the works schedule for getting the " Quarterly " to press and could delay its date of issue.

The early delivery of copy would be greatly appreciated.

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ROLE OF MAINTENANCE COMMAND

By Air Marshal Sir Kenneth Porter, K.C.B., C.B.E., C.ENG., F.I.E.E., F.R.AE.S., R.A.F.

MAINTENANCE Command provides supply and engineering support for all of the Royal Air Force Commands at home and abroad. This is a large responsibility and to meet it the Command undertakes many varied activities. Our Supply commitments can be summarised as the receipt, inspection, storage, modification and issue to the Royal Air Force of the entire range of equipment and spares; this includes many types of aircraft and also explosives and compressed gases. In terms of Engineering support we undertake an increasing proportion of the aircraft servicing, reconditioning, modification, conversion and repair work which was previously contracted to industry. As part of our job we also provide some supply and engineering support for Royal Naval Air Stations and the Army Air Corps. The purpose of this article is to describe a number of our several activities, the types of units which exist to do the work and the measures we are taking to improve the way in which we do it.

ORGANISATION

Before considering what the Command does it may be useful to set the scene in terms of its size and shape and how it is organised. There are two special points to note about the organisation: firstly, the Headquarters is based on a two-prong, instead of the usual three-prong, structure with both the main functions of engineering and supply placed under the Senior Air Staff Officer; the administrative staffs are controlled by the Air Officer i/c Administration in the normal way. Secondly, there are no Group Headquarters, although the Command employs about 24,000 people and its units are spread over a large area of the country. Numerically, we are bigger than any of the other Commands and two thirds of our manpower are civilians; we are in fact the largest employers of civilian labour in the Royal Air Force. Geographically, the Command extends northwards to Cumberland, eastwards to Norfolk, south into Wiltshire, as far west as Wales and further to Aldergrove, in Northern Ireland. There are 30 units functionally and administratively under the direct control of the Headquarters; and a further 17 are administered by the Command but functionally controlled by the Ministry of Aviation or Ministry of Defence. Among those units which we administer only, are the RAF Staff College, Andover, Central Servicing Development Establishment, Swanton Morley, the Supply Control Centre and the Joint Services Air Trooping Centre, Hendon, the Institute of Aviation Medicine and the RAF contingents at the MOA establishments at Farnborough, Boscombe Down and Pershore.

THE TASK

The supply and engineering task of the Command can best be described by looking in turn at the work of the various types of unit. The generic term Maintenance Unit which is applied to most of our functional units embraces a surprising number of distinctly separate undertakings. The Supply units perform many engineering tasks

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in maintaining and repairing their stocks of equipment. whereas some other units have very specialised engineering responsibilities.

The Supply of Equipment

Our largest units are the Equipment Supply Depots (ESDs) at Carlisle, Stafford, Hartlebury and Quedgeley. A fifth depot at Heywood, was closed in February this year as a result of improved storage methods which enabled a redistribution of Heywood's stocks amongst the other four units. The benefits of this reorganisation are substantial and amount to a saving of about £1 million a year in operating costs. The ESDs are mostly staffed by civilians—except Stafford which is about 40% Service manned—and all are controlled by RAF officers. Their total personnel establishment is around 10,000. Together these units hold a range of over 800,000 different items of equipment and these are allocated on a single point stockholding basis, that is to say, all items of one particular range are concentrated at one particular depot. All of the depots have direct links to the railways terminating in the depot transportation sections, with feeder lines to some depot storage sheds. The stocks of equipment are housed in over five million square feet of covered storage space and a further three million square feet of covered accommodation is used for the ancillary services connected with the receipt, maintenance, packing and issue processes. The total value of the equipment held in the depots has been estimated to exceed three hundred million pounds. Included in the wide range of equipments are stocks of supporting spares for some Royal Navy and all Army Air Corps aircraft. Some of the depots specialise almost entirely in equipment of a particular sort. Quedgeley is given over mainly to the supply of accommodation stores to all three Services, that is, furniture and some furnishings for offices, barrack blocks and married quarters. There is a smaller depot at Sealand which holds stocks of American radio equipment, and tentage, and specialises in the packing of short range aircraft, such as Hunters, Pioneers, Pembrokes and several types of helicopters, for transportation by sea or air. At Chessington we hold most items of medical and dental stores and equipment.

Meeting the Demand

The operational efficiency of RAF units all over the globe may depend upon the speed with which urgently needed spares and equipment can reach them. Maintenance Command meets high priority demands for the 'V' Force, Lightning Force, Strike aircraft and Long Range Transport Force within 8 hours of receipt at depot, and other priority demands within 48 hours. The high priority service operates twenty-four hours a day every day of the year. Automatic Data Processing, which came into operation at the Supply Control Centre, Hendon, in January, 1966, will ultimately provide a central record on the computer of stocks and consumption at all major units in the RAF world-wide. When this facility has been fully developed we shall have better control of existing stocks, and speedier and more accurate provisioning; this in turn will give a more efficient and economical supply service by improving our ability to meet demands more promptly, whilst avoiding unnecessary surpluses in stockholdings.

Ammunition, Compressed Gases and Petroleum

The Ammunition Supply Depot at Chilmark, the Compressed Gas Supply Depot

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at Cardington, and the 26 Petroleum Supply Depots throughout the UK, are stock-holding units with very specialised responsibilities. Chilmark holds conventional explosives, and oils and lubricants, in above ground and underground storage. The main underground store is an old stone quarry and, like much of the storage area on the unit, it is served by an internal narrow gauge railway system. The unit is also directly linked to the main railway line. By using improved storage techniques and modern handling aids better use has been made of the space available at Chilmark and, in 1965, it was possible to absorb the stocks of the sister unit at Fauld and close that unit with considerable savings in money and manpower. At Cardington we operate the RAF's own civilian manned gas factory which produces and distributes the bulk of the gases used by RAF units at home and overseas and also services gas cylinders. Some of this production goes to support the Royal Navy and other Government agencies.

It is also our task on behalf of the Ministry of Defence to supervise the Petroleum Supply Depots operated by the major oil companies in various parts of the country, to ensure that their installations and reserve stocks of fuel are properly maintained; again, we undertake a part of this service in support of the Royal Navy and the Army Air Corps.

Aircraft Supply and Servicing

The supply, storage and servicing of aircraft is undertaken at the five civilian manned Aircraft Supply and Servicing Depots (ASSDs), located at Aldergrove, Shawbury, Kemble, Wroughton and St. Athan and a Service manned General Engineering Unit, also at St. Athan. A major part of the task of the ASSDs is to hold the reserve stocks of aircraft for the RAF and the AAC, and some Hunters for the Royal Navy. They make the aircraft ready for storage, maintain them against deterioration, and prepare them for issue, as required. An important and expanding function of these units, and one which makes good use of the engineering effort available, is the extensive aircraft reconditioning, conversion, servicing and modification work which they do in support of almost all of the other Commands. Work, for example, on Varsitys and Gnats for Flying Training Command, Hunters for the Royal Navy, AFME and Germany, Twin Pioneers for AFME, Argosys and Beverleys for AFME and Transport Command, and Canberras for Bomber, Fighter and Signals Commands and RAF Germany—and these are only some of the tasks. Detailed costing studies have shown that, by exploiting our capacity to do work which would otherwise have to be contracted to industry, we are able to achieve significant savings in expenditure and in the time the aircraft are out of operational service. The task of supporting the 'V' Force by the major servicing of Victors and Vulcans is assigned to the General Engineering Unit at St. Athan. This is a Service manned unit with a well established, work studied approach to aircraft servicing. The time spent on each individual servicing job decreases as our teams gain experience but, as aircraft get older, more time has to be devoted to repairs and this often offsets the gains from more speedy completion of the servicing task. However, our aim is always to return an aircraft to its parent unit as quickly as possible and we are constantly seeking ways of improving our performance while maintaining essential standards of workmanship.

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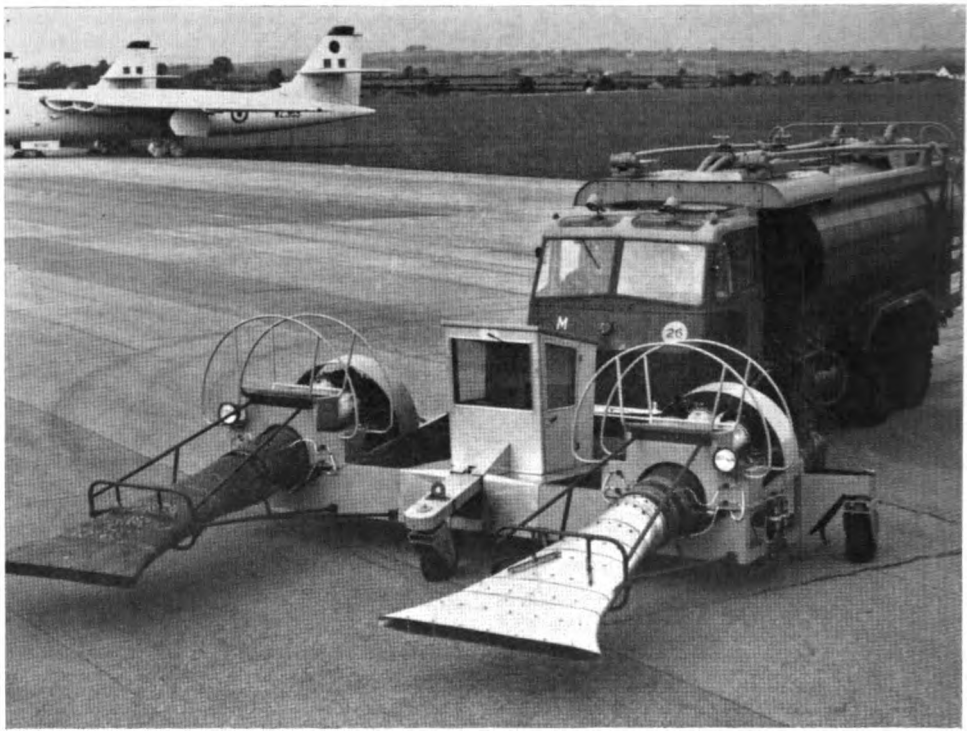

Runway de-icer manufactured by 32 M.U. General Engineering Unit, St. Athan.
(Ministry of Defence Photo)

Air Radio Servicing Workshops, Sealand.
(Ministry of Defence Photo)

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General Engineering

In addition to its aircraft servicing tasks the General Engineering Unit at St. Athan does repair and modification work which is unsuitable for allocation to industry, either because the quantities required are small, the urgency is great, or security is involved. Notable among a long list of manufacturing commitments is the construction of runway de-icers, consisting of two Derwent engines mounted on a chassis, of which over eighty have been made and which are now a familiar and invaluable item of equipment on many of our operational airfields.

Electronic Servicing

We operate a large Electronics Servicing Depot at Sealand which makes a major contribution to the engineering support provided by this Command. This unit operates a direct exchange scheme for the third line repair of almost all airborne radio/radar equipment, promptly replacing faulty components by serviceable items on a one-for-one basis, for all RAF and AAC units in this country, Germany and Malta; this service has also been extended to a number of RN Air Stations. At Sealand, large workshops have been well laid out on sound production lines to enable the unit to deal with nearly 800 different types of sub-assembly. The unit is in the process of expansion to take on the third line repair of electrical and instrument systems, including such items as flight instrument and control systems and the automatic landing system, and these items will eventually be included in the direct exchange scheme.

Repair and Salvage

Finally, in this survey of the work of the Command and the types of units which exist to provide these diverse services, mention must be made of the Repair and Salvage Units (RSUs) at Leconfield and Bicester. These are Service manned units with the job of salvaging crashed RAF and Army aircraft in the United Kingdom, parts of NW Europe, and Central Mediterranean area and North Africa. They also send teams anywhere in the RAF to do major aircraft repairs and modification work beyond the scope of the units holding the aircraft.

PRODUCTIVITY

Although the front line of the RAF has decreased considerably since the war it is important to realise that the transaction load at the Supply Depots in this Command has remained at about the same level. It was mentioned earlier that we are dealing with about 800,000 items of equipment; we expect this to increase to something like 930,000 by 1968. This is because aircraft and equipment are increasing in complexity and in the number of component parts. Large quantities of new ranges of equipment will be added to existing stocks to support the buys of new British and American aircraft which will enter into service by 1970. Much of the new equipment has to be acquired before it is possible to dispose of the spares for the older aircraft gradually phasing out of service. To meet these increasing commitments and, at the same time, to effect savings in money and manpower we are concentrating on increasing our productivity. Every pound saved on the supporting services makes more money available for the purchase of the expensive, highly sophisticated aircraft and weapons which the Royal Air Force needs to fulfil its role. Over the past few years we have

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made many reductions in the number of units; we have concentrated our stocks by range on the single-point stockholding basis; we have made good use of work study methods to improve the efficiency of the supply and engineering processes, with consequent savings in time, manpower and materials; and we have begun the conversion of our accounting and stock locating systems from the voluminous and inflexible paper voucher processes to the smooth precision-accuracy of the computer.

By early 1968 it is planned to introduce individual computers to improve stock location, accounting, and stocktaking at each of the four ESDs. The introduction of the depot computer is not only a desirable improvement over tedious paper-work processes, it has other practical advantages. Under the old system it was necessary to pay due regard to how and where the equipment was stored, because stock location, accounting and stocktaking were all physical processes. To do all of these things as speedily and efficiently as possible it was easier to store everything by range or vocabulary section, irrespective of size, so that they could be counted and documented more effectively. The penalty for this convenience was the inflexibility imposed on the storage and handling of equipment within the Depot. By using the computer these restrictions will be removed because it will record the stock location of every item on the depot and will print this information on every voucher. It will then be possible to store in the most efficient manner according to the handling characteristics and size of each particular item. Although this may sound simple, it must be remembered that we hold over 800,000 items (many times more than any single business or industrial concern anywhere in the world) which vary in size from a washer to an aircraft mainplane. For economy and efficiency the best solution is to store by handling characteristics. All the small items can be located together, regardless of range, in well designed, easily accessible, multi-tier storage racking; whilst the larger items can be stacked to make the best use of cubic capacity of storage sheds, using the extensive range of greatly improved mechanical handling aids. All of this amounts to better use of the storage accommodation available, improved working conditions for the producer, and big savings in time, money and manpower.

THE FUTURE

The future is one of challenge and great opportunity for Maintenance Command; by improving both engineering and supply practices I am confident that we shall be able to raise our productivity still higher and to make an important contribution to the greater utilisation of the fewer and more expensive aircraft which are now in operational service. Not only should we be able to sustain the Royal Air Force more effectively with an even better service than before, but I feel sure we shall make still further valuable savings in the process. If we succeed in this we shall free more of our dwindling defence budget to provide the money where it is most needed, in the purchase of the aircraft and weapons which our Service must have to play its full part in the defence of the Nation.

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BOGDANOV'S TEST-FLIGHT

By Wing Commander G. C. T. Richards, M.A., R.A.F.

TWENTY-FIVE years ago it was. Twenty-five years on the 18th of January. And I can picture it all now, as clearly as I can picture Groucho's walk or the silhouette of a Spit. The airfield ten feet deep in snow, with a runway, not cleared, but simply rolled hard and edged with black flags. You see, you can't judge your height over snow, and there is no horizon. So every landing is a sort of photographic negative of a night landing, with the ground white and the flares black.

Bogdanov was a compact, alert major, with an earthy sense of humour, the 'hands' of an angel, and a lot of medals. In the three months we had been together in this way-out bend of the Volga he had taught us a lot about snow-flying and we had taught him a fair bit about flying Hurricanes.

The only other character in the cast was the Station Commander. He was a Lieutenant-Colonel — a Pot-Polkovnik — of, as it seemed to me then, venerable age and benign nature. I shall never forget his sad smile as he told me, after one of my Hurricane exhibitions, that he would assuredly bury me in Russia.

The Christmas present arrived in December. It was a large crate with AIRACOBRA written on the outside. I don't suppose many of you remember the Airacobra. Taken all round it is probably better forgotten. It was an ambitious aircraft for its day, but its ambitions outstripped its talents. For a start, the engine was behind the pilot, and if you applied the brakes too hard it tended to nudge you in the kidneys, or so the pessimists said. Then it had a new-fangled tricycle undercarriage. Perhaps we were not used to the idea, or perhaps its legs were too long or something, but its landing run always looked to us like a bath-chair out on a jag. Last, it was all electric. Nothing hydraulic or pneumatic about this baby; switches activated her every operation.

For some reason Pot-Polkovnik went all temperamental and proprietary over his Airacobra set. National pride, I suppose. He had accepted us as the Hurricane experts, but he took the view that American aircraft were as foreign to the British as they were to the Russians. So, when we offered our help, he declined it with icy thanks and added, with some hauteur, " We have our own methods for dealing with foreign aircraft." Nor was his formal rejection of our aid an empty gesture. He had us escorted from the Airacobra hangar at the point of the OGPU.

But during the evening vodka sessions we heard a great deal about the engineers' difficulties. The undercart, for example, worked on the cuckoo-clock principle. The wheel recesses were guarded by little doors which opened to let the wheels out and closed again when they were safely back home. The Russians found that by some inexplicable electrical quirk the doors had mistaken their function and were slamming themselves inhospitably in the very faces of the lifting wheels. Then there were problems with the flaps. They were operated by a simple two-way switch: UP or DOWN. By some error of circuitry the Russians had offered the

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pilot two equally unstable alternatives: port up, starboard down; or starboard up, port down.

Throughout it all Pot-Polkovnik kept a brave face. In addition, I fancy, he organised a security clamp. For two weeks his engineers either avoided our company or drank their vodka with sealed lips, starving our curiosity. It was on the evening of 16th January that the security curtain was twitched aside. Pot-Polkovnik, with a vodka in each hand and a gleam of triumph in each eye, announced:

" The Airacobra flies tomorrow."

We were startled. "Have you solved all the problems?"

" There are fifteen things we do not yet understand. Our test pilot will find out about them in the air."

We did not argue. Pot-Polkovnik, conscious of the value of a good curtain-line, had left. Bogdanov seemed unworried. But we were not wholly re-assured.

Now, by the standards of 1941, Bogdanov was a good test-pilot. He believed in taking it gently. None of this straight off the ground in a climbing roll in a brand-new aircraft stuff for him. His ploy was to roar down the runway till she unstuck, then cut the throttle and drop her back again. So he climbed aboard, tested the controls, ran the engine hot, and opened up to about three-quarters throttle.

She obeyed his every touch. Nose down she trundled, nose level she galloped down the runway. She unstuck, sank back, and ran — and ran — and ran. Brakes are not much help on rolled snow. She was still rolling at about 20 mph when she hit the snow bank at the end of the runway. One of the things Bogdanov had not known was that her unstick speed was considerably higher than the Hurricane's.

They pulled her backwards out of the snow. She seemed undamaged except that the nose-wheel leg had a nasty kink in it. While we stood and surveyed her Pot-Polkovnik despatched a runner. In the falling dusk we left her, stranded and forlorn. As we drove away we met a blacksmith armed with a storm-lantern, a blow-lamp, and a large hammer. The runner had delivered his message.

Bogdanov was cheerful in the bar that night. On the whole his first run had been a success. The damage was slight and easily repaired. Besides, he knew a new fact, the unstick speed, and this reduced what you might call the x-factors to fourteen. He seemed to believe that this significantly shortened the odds against a successful maiden flight on the morrow.

We escorted him back to her side the following morning. Perhaps 'escorted' is not the best word, redolent as it is of the pomp of a firing party or a funeral cortege. But then, as memory comes flooding back . . . let me say just that it would not have seemed the best word to Bogdanov. He was bubbling with that blend of confidence, elation, and excitement that is familiar to any pilot of any nationality. When we arrived the mechanics were just removing the thawing equipment that was always needed when the temperature fell blow minus forty and the oil froze solid in the sump. The two great hoses had been removed from the air-intake and the engine cowling, and the giant Primus stove and fan that fed hot air through them

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was being wheeled away. I must admit she looked good — except for those extraordinary legs. We examined her front leg. There was a blued-steel bruise on her shin where the kink had been, but at least the leg looked straight to the naked eye.

Bogdanov slipped happily into the cockpit.

Perhaps this is the moment to explain about the automatic boost control. You see, it was one of the things that Bogdanov didn't know about. And we didn't know that he didn't know about it. And even if we had known, we didn't know that the Airacobra didn't have one because we had not been shown Pilot's Notes.

You know how it is with atmosphere: the higher the thinner. So the higher you climb the harder the supercharger has to work to supply the engine with air. But if it were allowed to pump with the same vigour at ground level it would pump more pressure than the engine could take, and something would have to give. The automatic boost control took care of this problem. You could push a Hurricane's throttle wide open at any height, and a cunning little aneroid saw to it that the engine was not over-loaded. The Airacobra did not have this refinement. The pilot was supposed to keep an eye on his boost gauge and handle the problem himself.

So there was Bogdanov, all ready to go. He held her on the brakes till he reached about half-throttle and, when she started to slide, he released her. Also, with a firm, smooth thrust, he opened the throttle wide. That take-off would have dropped the jaws of even a 1970 Farnborough crowd. One moment, there was an Airacobra quivering at half-throttle. Next moment, in a blizzard of screwed-up snow, she was gone. We side-stepped the blizzard in time to see her racing up the runway trailing this induced snow-wrack behind her like a bridal train. She left the ground and her climb steepened in a dramatic parabola. She must have made a record climb to 1,000 ft. that was not broken till the Hunter.

It was at about 1,200 ft. that she exploded. Not dramatically you understand, but in a deliberate sort of way. First the air-intake fell off. Then a feather of flame showed itself behind the cockpit. Then Bogdanov fell out. Shedding little bits as she went the Airacobra whirled away heading for the eternal snows. We were not worried about her. We were too busy worrying about Bogdanov, for his parachute had not been seen to open.

We found him at last, his parachute lying limply on the edge of the tidy hole he had drilled in a blessedly deep drift. He was concussed, no more.

We visited him as he lay in bed with the top half of his poor old head apparently held together by tape, like a bound cricket-bat. We didn't tell him how it had happened because, at that time, we didn't know ourselves. But there was something we could have told him, and did not. We thought he was not ready for the news. A signal had been received the day after his flight. It read:

> THIRTY AIRACOBRAS COMMA WITH ERECTION AND TESTING PARTY COMMA LEFT ARCHANGEL TODAY FOR YOUR BASE STOP ONE CRATE AIRACOBRA SPARES DESPATCHED TO YOU LAST MONTH STOP ACKNOWLEDGE SOONEST STOP END OF MESSAGE

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Saturday, 6th May, 1967

7.30 p.m. to 1.30 a.m.

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TWENTY-FIVE YEARS OF PARTNERSHIP

By Major General Clyde Box
Commander, Third Air Force

THE United States Air Force—then the United States Army Air Corps— came to the United Kingdom 25 years ago as a wartime ally of the Royal Air Force. Today we are joined as allies for peace in one of the most remarkable military partnerships of modern times; a partnership which contributed to the victory in the hot war of the 1940's and helped preserve the peace in the cold war that followed.

When the first American pilots came to Britain during World War II, aviation was still in its Victorian era. Today, USAF pilots fly from British bases as part of an Air Force performing actual accomplishments of the "fantastic" science fiction stories of two decades past. Almost a generation separates the hot war B-17 and P-38 pilots from the technically-minded pilots of the RF-101s and RF/F-4C's today flying from bases in the United Kingdom. Many World War II pilots—veterans of missions against Regensburg, Ploesti, Schweinfurt, and Normandy—have recently completed their military careers; others are making retirement plans. Boys who were in primary school when P-47's were strafing enemy tanks beyond the Normandy beachhead are today flying supersonic jets on NATO practice exercises. Yes, the equipment, conditions and people have changed, yet there remains a common bond between these two eras—the close RAF - USAF partnership which marks its 25th year of existence in 1967.

The present chapter of RAF - USAF cooperation is normally marked by USAF's return to Britain in July, 1948, as a result of the Berlin crisis—less than two years after the last World War II unit had departed for the United States. The story really begins in January, 1946, a time when most people had one thing on their minds—demobilization. Two exceptions were General Carl Spaatz and British Air Marshal Sir Arthur Tedder who were making a farewell trip to USAF bases in Britain about that time. Worried about the fully armed Soviet military force that stood ready in the East while the West disbanded, they wondered what would happen if the United States found it necessary to deploy its long range B-29's to Europe. Not a single British airfield was equipped to handle them. To correct this, they decided informally that the RAF would prepare four East Anglia bases to receive B-29's—just in case. The decision was a wise one.

The story of the Berlin Blockade of 1948 with its airlift of 2,343,315 tons of food and coal into the city by RAF and USAF planes is well known. Not so well publicized was the movement of Strategic Air Command B-29's into the fields that had been prepared for them. These USAF bombers—in conjunction with the striking

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power of the RAF—provided the West's answer to the powerful strength of the Red Army. They were a warning to the Soviets against pushing too far. And they were the beginning of a revived USAF build-up in the United Kingdom which has continued to this day with the same mission of deterring aggression.

These first bombers—arriving in July and August, 1948—were based at RAF Scampton, RAF Marham, RAF Waddington, and RAF Lakenheath. The Third Air Division (Provisional) was activated just prior to their arrival to prepare to receive, support, and operationally control these units on what was expected to be a 30 to 60 day temporary duty. It soon became apparent that this was not to be the case. On August 23, the provisional title was dropped and on September 8, the Third Division moved into quarters at South Ruislip Air Station.

From 1948 to 1950 all US combat air units in the United Kingdom were under the operational control of the Third Air Division. Throughout this period Strategic Air Command bombers rotated for 90-day periods to U.K. bases—adding RAF Sculthorpe to the original four East Anglia sites. As evidence of Soviet truculence mounted, plans were made to build four new USAF bomber bases with the United States and Britain sharing costs. Because of the vulnerability of the Anglia bases, it was decided to place the additional facilities behind the RAF fighter screen. After careful consideration of several sites in England and Scotland, the two partners agreed that the B-29 stations would be located at Fairford, Greenham Common, Brize Norton, and Upper Heyford. The arrangement for building these bases was covered by an "Ambassadors Agreement" signed in April, 1950, by the U.S. Ambassador Lewis Douglas and the U.K. Under-Secretary for Air Aidan Crowley. They were to be available so long as the presence of USAF units in the country was "considered desirable in the interests of common defense."

Hardly had the agreement been made when in June, 1950, war broke out in Korea, calling for the use of large numbers of United Nations troops. To insure that the situation did not bring trouble in Europe while fighting was going on in the East, a strengthening of Western defenses was required. Again the RAF - USAF partnership proved its worth. Service-to-service negotiations which began immediately culminated in the signing of a "Special Construction Program" in February, 1951. Designed to provide a solid base for both tactical and strategic air operations in Britain, the program called for 26 bases in addition to the four covered by the Ambassadors Agreement—the cost to be shared by the two governments.

To control this massive base complex, the Third Air Division was inactivated and replaced by the Third Air Force on May 1, 1951. Coincidentally, this was the same Third Air Force which ten years earlier had organised the Eighth Air Force for its move to Britain and trained the bomber and fighter pilots for the air war over Britain. On March 20, 1951, the 7th Air Division, a major Strategic Air Command sub-command, had been organized to handle the operations of Strategic Air Command bombers from United Kingdom bases. Under a Joint Transfer Agreement signed on May 16, 1951, the 7th Air Division - Third Air Force relationship in the United Kingdom was delineated. Broadly, this agreement gave the 7th Air Division all strategic operations in the United Kingdom and left Third Air Force with

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responsibility for logistical and tactical activities. One of the first 7th Air Division Commanders was the present Chief of Staff of the United States Air Force—General John P. McConnell.

On September 9, 1951, Third Air Force received its first tactical unit — the 81st Fighter Interceptor Wing. A second unit—the 123rd Fighter Bomber Wing—followed on December 5, 1951. The assignment of the atomic-capable 49th Air Division with its 47th Bomb Wing and the 20th Fighter Bomber Wing on June 5, 1952, provided Third Air Force with its third and fourth tactical units. By mid-1952 the Third Air Force military personnel strength reached a peak of 27,573. The total number of U.S. military personnel in Britain—including United States Air Forces, Europe, Strategic Air Command, and U.S. Army units, rose to 45,029. In addition there were 3,478 British and U.S. civilians working with the Air Force and 28,436 dependants for a total of 76,943 people in the theater.

The job of developing the necessary base complex continued throughout the early 1950's, being simplified in September, 1953, by the signing of a U.S. - U.K. Cost Sharing agreement. This arrangement brought together all previous agreements on joint construction and set forth clearly what each nation would contribute. Basically, it called upon the British to provide approximately £22½ million toward construction with the United States paying any amount above that figure. Total costs were estimated at about £107 million. For this amount, 43 major airfields would be available for use in peace and war. This, of course, was at a time when USAF plans called for a major Strategic Air Command overseas wartime deployment. The program was revised downward in later years because of changes in the international climate and the development of new weapon systems and techniques. The successful deployment of Strategic Air Command's first B-47 wing to the United Kingdom in 1953 and the first experiments with aerial refueling were destined to change the overseas deployment strategy.

Between 1954 and 1958 the changing pattern of military strategy and the changing temperature of the cold war produced changes in the USAF organization and force structure in Britain. The Burtonwood Air Depot began phasing down from its peak strength of 10,000 people as overseas units began getting direct support from depots in the United States. The 49th Air Division was inactivated on March 21, 1956, and its two wings assigned directly to Third Air Force. The 406th Fighter Interceptor Wing, which had replaced the 123rd Wing on December 5, 1951, was inactivated on May 15, 1958. The 7th Air Division was able to cut its strength almost in half in 1955 because of a switch from 90-day rotational tours of its wings to much shorter post-strike operations. The Army antiaircraft and smoke generating units left Britain in 1956, their usefulness overtaken by technology. These developments were reflected in the United Kingdom base program which in 1955 was cut to a total of 26 sites and further reduced in the years that followed.

Although reduced in size compared to the dangerous years between 1948 and 1954, USAF forces in Britain retained a potent combat capability. In conjunction with RAF forces, the USAF stood alert during several international crises, including those involving Indo-China (1954), Hungary (1956), and Lebanon (1958). During

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these years, too, Third Air Force wings converted to later model aircraft, replacing the F-84's and F-86's with the more modern F-100's and the B-45's with the B-66's.

1958 ushered in the era of missile-age cooperation between the USAF and the RAF. The government-to-government agreement on basing 60 Thor intermediate range missiles in Britain was signed on February 22, 1958. With the airfield construction program the installations were jointly constructed and then turned over to the USAF who operated them. With the Thor, however, the USAF provided the equipment, assisted in construction, and then moved aside for the British to handle operations. By the end of 1958 the first missiles were in place. By mid-1960 all 60 missiles were positioned and under RAF control with the 7th Air Division charged with control of the warheads. This arrangement was in force for five years. In 1963, the need for intermediate missiles passed with the advent in quantity of the long-range intercontinental ballistic missile (ICBM's). Deactivation of the Thor sites began in April, 1963, and was completed by the end of the year. In the meantime the strength of British-American solidarity had been made very clear.

Similarly, in 1960 the British Government agreed to the placing of the third link in the Ballistic Missile Early Warning System at Fylingdales Moor. The Fylingdales station provides early warning of ballistic missile attacks on the United Kingdom and constitutes the third link in a chain giving early warning of missile attacks on North America. The other two stations are located in Greenland and Alaska. By agreement, the cost of the Fylingdales installation was borne by the two governments. The station was commissioned on September 17, 1964, and operates jointly under the RAF and USAF.

The latest phase of the USAF's postwar history in Britain might be considered as starting in 1959, the year President De Gaulle placed limitations on our tactical forces in France. As a result, two combat wings moved into Britain—the 10th Tactical Reconnaissance Wing and the 48th Tactical Fighter Wing. Although not apparent at the time, this was but the first step in the total withdrawal from France. In March, 1966, the French Government made public its decision to withdraw from military participation in the North Atlantic Treaty Organization (NATO) alliance. Forced to find a new home for its tactical units, the United States Government approached Her Majesty's Government with a proposal to deploy several units to Britain. As in the past, the idea of partnership and cooperation in our common defense was foremost in the minds of the negotiators. As a result in mid-1966, after consultation with our joint NATO allies, USAF forces in the United Kingdom were increased by the transfer of the 513th Troop Carrier Wing, the 66th Tactical Reconnaissance Wing, and one additional squadron of reconnaissance aircraft from France to British airfields. During the same time period the tactical power of USAF units was increased by conversion from the F101 and RB-66 to the F-4C and RF-4C Phantom II.

Twenty-five years of cooperation between tthe RAF and the USAF have led to close operational integration. The RAF handles air defense and air traffic control responsibilities for all units in the country. Recent exercises have proved the feasibility of air-to-air refueling of USAF fighters from RAF tankers and vice versa, providing greater flexibility of operations in time of crisis. Close coordination exists

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between the two services in operational planning, and operational training which provides the opportunity for both the RAF and the USAF to fly close air support for British ground forces. Begun in 1964, USAF units are now regularly asked to provide a number of close support and reconnaissance sorties for British Army field exercises—providing excellent training for both forces.

The USAF - RAF partnership in air power is accepted by both countries as a requirement in the interest of common defense. The Labour Government under Prime Minister Clement Attlee invited the USAF to Great Britain in 1948 and the Conservatives who took power in 1951 supported and continued this invitation. There was no change when the Labour Party returned to power in 1964. Despite intermittent propaganda blasts from the Soviet Union over the presence of USAF bases in Britain, the arrangement has remained firm throughout the years.

The very presence in Europe of RAF and USAF units working hand-in-hand has helped prevent a third world war—especially in the early 1950's before the existence of a strong NATO and the ICBM. The greatest proof of the effectiveness of the RAF - USAF partnership in the 18 years since 1948 is the fact that neither nation has had to fly a mission of violence from bases in Britain.

The fruits of 25 years of cooperation in hot and cold war are obvious—victory in hot war and deterrence in cold war. Both the United States and Great Britain are committed firmly to a strong Western alliance, both nations seek a workable disarmament agreement with the Communist world, and both nations seek to preserve the basic values of human freedom and dignity which they share in common.

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3 Page „ „	1,600
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Rolls-Royce Spey power for American Combat Aircraft

Pictured here under preparation for test running is the supersonic Spey-25 turbofan with fully variable afterburning.

s on 27th June 1966, less than two years the go-ahead was given for the develop- t of the McDonnell Phantom II strike er for the Royal Navy and Royal Air Force, the military Spey-25 powered version of this aircraft made its first flight. It has also recently been announced by the United States Defense Department that they plan to use a variant of the Spey to power USAF Ling-Temco-Vought A-7D close support aircraft. The Spey turbofan for the A-7D will be jointly developed and produced by the Allison Division of the General Motors Corporation and Rolls-Royce.

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"Argosy" aircraft of No. 105 Squadron over Aden
(Ministry of Defence Photo)

British officers and men with a soldier of the Federation of South Arabia.
(Ministry of Defence Photo)

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HALF A CENTURY OF LOYAL SERVICE

By Wing Commander A. G. T. James, o.b.e., a.m.i.p.m.

The crest of No. 8 Squadron—motto "Into the remote places"—which has been based at Aden, on and off, since 1928: showing the 'gambiyah' tribal weapon.

NEXT year, the curtain will ring down on more than half a century of close association between the Royal Air Force and Aden. The RAF link with the Colony (now a Federation of self-governing States) dates from the 1914/18 war, when aircraft operated against the Turks from a rudimentary landing ground. During and after the Second World War, the RAF continued to develop Aden as a strategic and tactical air transport base, but in 1968 the Federation of South Arabia is to be granted independence. British forces will withdraw and some RAF units will re-deploy to existing airfields in the Persian Gulf.

Meanwhile, the situation is a delicate one. The Yemen has for many years made territorial claims on the Federation of South Arabia and these claims became much more vociferous when the Republican regime overthrew the Royalists with the help of the Egyptian army. Tribal leaders in the Federation were bribed to foment trouble and, in April 1964, what amounted to armed insurrection broke out in the rugged, inaccessible Radfan area. Middle East Command had to mount a full scale operation to regain control. This operation at its height occupied a Brigade headquarters and the equivalent of four infantry battalions with appropriate offensive, reconnaissance and transport air support. Although the operation was successful, ever since, there have been frequent mine and sniping incidents throughout the Federation and dissident raids from across the Yemen border.

Pressure on Britain to leave South Arabia has resulted also in terrorist activity in Aden itself during the past two years. This is organised by FLOSY (Front For The Liberation Of The Occupied South Yemen) a bunch of thugs controlled from far beyond the frontiers of the Federation. Her Majesty's Government suspended the Aden Constitution in September 1965 and since then the terrorist campaign has been

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to some extent contained, but the best part of two Army brigades reinforced by Marine Commandos and assisted by air forces have been fully occupied with internal security tasks such as continuous patrolling, curfew enforcement, search operations and checking of movement into and out of Aden. Their successes so far include the arrest of a number of key members of FLOSY. This, as we discovered in the course of a recent visit, is the background against which the RAF in Aden continues to go about its daily task, in close co-operation with British and Federal ground forces who, up country, are largely dependent upon the RAF for supplies and communications.

In a Blackburn Beverley tactical transport aircraft of No. 84 Squadron (motto "Scorpiones Pungent") we flew to Mukairas, a large village with an associated landing strip levelled out on a plateau at 6,900 feet altitude and so near the Yemen frontier we had to make a right hand circuit to avoid infringement. While we drank coffee with the RAF Detachment Commander, a tribal warrior turned up with a new rifle, stamped with a star, and bandoliers full of ammunition and insisted on each of us taking a shot at an empty coffee tin upon a distant rock. He nearly burst with pride when, firing from bended knee, he was the only one to score a hit.

Next day, we flew by Army Air Corps Beaver to Wadi Ayn, another remote Army camp up at 3,000 feet on the Yemen frontier, where the RAF was represented by two firemen, manning the air strip's sole fire fighting vehicle.

Back in Aden we visited No. 37 Martime Reconnaissance Squadron (motto "Wise Without Eyes"). Because of the Rhodesian crisis some of their Shackletons were detached to Madagascar to keep an eye on the movement of oil tankers in the Mozambique channel. We also called on No. 8 Hunter fighter-ground attack squadron, based at Aden, on and off, since 1928. During those early years, the whole territory had been under Air Control and this squadron had played an important part in its defence and pacification. The head waiter in the officers mess at Aden's main airfield — RAF Khormaksar — (motto "Into The Remote Places") has been serving cool drinks to successive generations of young pilots of No. 8 Squadron for close on 40 years. He wears with great pride, the squadron badge — a native dagger — in his turban. Wherever the squadron goes when it leaves Aden, he is determined to go with it.

From day to day, in the present situation, one never knows what may happen next. Apart from internal security problems — shootings in back streets, hand grenades hurled through windows — the RAF is concerned in helping the Army to maintain the integrity of more than 1,000 miles of frontier with three different countries, Yemen, Saudi Arabia and Muscat and Oman. Within the 113 square miles of the Aden Federation more than twenty different Sultans, Emirs and Sheiks have treaty connections with the British and in numerous quarrels amongst them, the British attempt to play a pacifying role. It is a mountainous, waterless and barren land only some 2% of which is cultivatable and from this, a population of some 700,000 must scrape a precarious livelihood. Little wonder then that different tribes will defend — with Russian rifles and Egyptian grenades — each their own small cultivated patch of land. Little wonder also that they will accept arms from

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all who offer them without being too particular against whom they use them, so long as they are well paid for the job. Although parties of armed warriors and foreign aircraft are involved in shooting affrays across the Federation's frontier with Yemen, the RAF is better known amongst the tribes for its missions of mercy; the evacuation of the sick to hospital and the carriage of supplies to local forces encamped in areas inaccessible to other means of transport.

On our final day at RAF Steamer Point where the mess stands within earshot of the waves driven by the south west monsoon across the Indian Ocean, we met a number of young officers from RAF Ground branches. With volunteer airmen from their various sections they had been taking turns to relieve the Army on patrol duties and had received their share of hostile grenades. Oddly, they said, volunteers increased in proportion to the increase in grenade and shooting incidents. We talked to them of how, since its capture by the East India Company in 1839, Aden had become the greatest oil bunkering port in the world with about 500 vessels calling each month. Although more than three quarters of the city's population are Arabs, the remaining quarter are Indians, Somalis, Europeans and Jews who play an important part in trade and in running such facilities as the port and oil refinery.

The aim of course is to withdraw British forces, when the time comes, in a quiet and orderly fashion. But certain sections of the Arab world wish to demonstrate that it is they who are forcing the British withdrawal and they will no doubt do their best to make the final stages as uncomfortable and dramatic as possible. After 1968, the future of Aden will be in the hands of its own people, but meanwhile, let it not be forgotten that it was the British who raised it from a village of about 400 inhabitants and gave it back its ancient prosperity and British officers and men who, from the beginning to the end, have served the Colony and Federation honourably and well. Not a few of them have given their lives in such service. There are many Arabs whose enthusiasm for the Arab cause is tempered by a liking for the British and a realisation of material benefits brought by the rule of law supported — as a last resort — by a highly discriminating use of force.

HISTORY OF No. 110 (HYDERABAD) SQUADRON

No. 110 (Hyderabad) Squadron celebrates its Fiftieth Anniversary this year. It is hoped to produce a comprehensive history of the Squadron, for this occasion, and material is required in the form of stories and anecdotes, with photographs if possible.

Material should be sent to:— Flying Officer D. J. Carey, 110 (Hyderabad) Squadron, RAF Seletar, c/o GPO Singapore.

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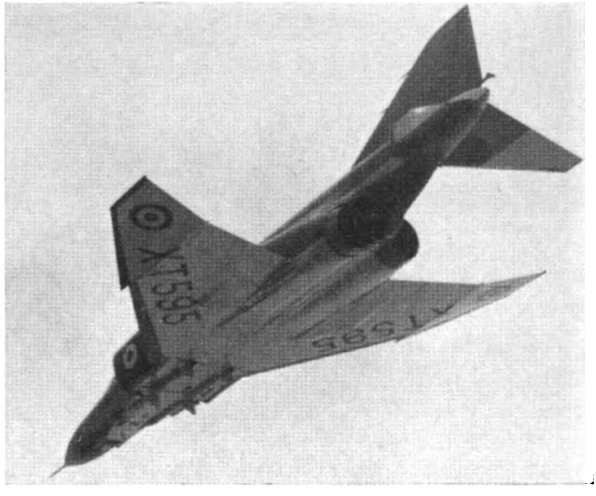
'WILL JACK BE ALRIGHT?'

SOME VIEWS ON AIRCREW TRAINING FOR MULTI-ROLE AIRCRAFT

BY WING COMMANDER I. M. PEDDER, O.B.E., D.F.C., R.A.F.

DURING the next few years the Royal Air Force will be receiving aircraft designed to undertake a variety of exacting roles. We are told that the F111K and the Phantom, between them, will be capable of air defence, strike, offensive support and reconnaissance operations; and, no doubt, they will be fitted with a range of free-fall weapons, air-to-air and air-to-ground missiles and guns, as well as comprehensive reconnaissance equipment. To achieve the global mobility necessary to sustain an east-of-Suez policy in the 70's they will also have to be capable of all-weather in-flight refuelling. Bearing in mind the unit cost of these aircraft and the small numbers which have been authorised, it is clear that their considerable operational potential must be more than realised—it must be exploited. Since we will not be able to provide two or three specialist crews for each aircraft, it follows that the F111K or Phantom crewmember will have to be trained to become a Jack-of-all-trades. The question is: can this be done successfully or will the old adage prevail and will he end up being master-of-none?



THE McCONNELL F-4K PHANTOM

Perhaps I should make it clear that I have no official connection with this problem, which is one that must be exercising a number of flying training staffs. The object of this article is to put forward a point of view in the hope that it will excite interest in a currently burning question—and perhaps even encourage a few letters to the Editor!

When we are confronted with problems of this nature it is often worth recalling any similar previous experience we have had—after all, twin-engined, two-man crew, multi-role aircraft are not unknown to the RAF. For example, there was the Mosquito, that swinging aircraft of the 40's. Thirty-eight marks were produced for the RAF and their roles included day and night fighting, bombing, reconnaissance, interdiction, ground attack, training and target towing. Hundreds of Mosquitos were available to the Service and it was therefore possible to produce specialised versions built to carry out only one role.

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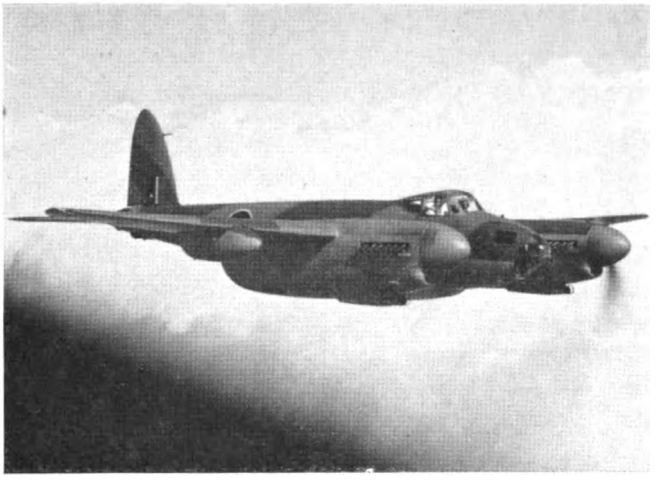

De Havilland Mosquito Mk. 16

In the '40's aircrew ratios matched the large numbers of aircraft that were available and so aircrew specialisation was also possible and this was an accepted way to run a powerful air force. For example, the Mosquito PR operators were a different breed to the interdictor crews and both tended to work in isolated compartments. Even their pilots notes and standard procedures had little in common and each had their own OTU.

Behind the aircraft and the aircrew there were thousands of groundcrew, and a substantial reservoir of spares—all of which originated in the United Kingdom and were easily accessible. Backing of this nature meant that enough flying hours were available to the Mosquito force to ensure that adequate conversion and continuation training was possible. Whether or not it was achieved is another question; twenty years ago we were probably not as efficient in our training organization as we are today. Nevertheless, conversion courses allowed each specialist crew some 80 - 100 flying hours and when the crews reached squadrons they could probably count on getting over 30 hours a month at peace-time rates. How can this experience with the Mosquito help us to identify the problems which we face with the introduction of our new equipment?

Let us begin by highlighting the differences. First of all, we are not getting hundreds of aircraft; the buy from the U.S. is strictly limited. Because of the small numbers available we cannot afford to elect for a high degree of aircraft specialisation. Aircraft and crews will be expected to perform all the roles which have been built into the aircraft; hence, the Jack-of-all-trades concept. This may be a viable proposition, but how much training potential have we available?

Once again, the limited numbers of aircraft purchased is at the core of the problem. If we have only, say, 50 aircraft– all with an operational as well as a training capability—how many can we afford to allocate to the training role—20, 10 or 5? Let us assume that our aim is to keep at least 75 per cent of our aircraft in the front line, so, allowing for the storage of reserves, only ten aircraft might be available for conversion training. The problem is further aggravated when we realise that the numbers of highly trained groundcrews necessary to service these complicated aircraft and their support equipment may also be limited, and that the main supply of spares comes from the United States and these may be subjected to limitations because

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of financial exchange or political difficulties. These thoughts lead to the inescapable conclusion that the number of flying hours available for training is likely to be substantially short of the ideal and we must now consider whether we can in fact train the multifarious force that we seek. How can we attempt to augment the flying hours available on the operational type?

At the OCU stage it may be possible to introduce crews to basic exercises using a more economic aircraft which nevertheless is capable of high performance—particularly at the lower altitudes, where the subsonic performance of the operational aircraft could be more nearly matched. The Hunter 7 might be suitably adapted for this role and it would allow a crew to train together in low-level navigation, weapons and recovery exercises. The other significant adjuncts to the training process are the flight simulators, and since we are searching for all the augmentation we can find they should be as comprehensive as possible and available both to the conversion unit and to the squadrons. The flight simulators we need in this case must be crew trainers and be provided with the latest techniques of visual and movement simulation so that crews are able to 'fly' a complete mission from take-off to weapon delivery/reconnaissance and on to recovery.

There is nothing new in this idea of augmenting training capacity by the use of more economic aircraft and simulator techniques, as Fighter Command might be quick to point out. But, no matter how much training augmentation is available certain minimum flying hours in the operational aircraft are necessary if a reasonable degree of operational efficiency is to be attained—and maintained. And it is therefore the limitation on operational aircraft hours for training which will prove to be the over-riding problems. What has to be decided, in the case of the F111K and the Phantom, is our capacity for training crews at the conversion stage and how we are to make up the balance. I believe that the facts which have been considered so far and our past experience lead to the conclusion that we will not be able to train crews at the OCU in more than one operational role, and we must now choose which role that might be.

The 1966 Defence Review tells us that the F111K is a Canberra replacement and that it is required for two roles: 'to obtain early warning of an enemy's intentions through reconnaissance, and to strike at his offensive forces from a distance in case of need'. Later in the same paragraph the Review says that the aircraft '—will be supplemented in the strike role by the V-bombers'. From this one might deduce that the F111K is required as soon as possible to replace the ageing reconnaissance Canberra force whilst our strike capacity is not in such urgent need of reinforcement. After all, the Mark 2 V-bombers have only entered service comparatively recently and they are likely to continue to provide a significant strike capacity for some time to come. It would seem reasonable therefore to expect the F111K OCU to concentrate on converting crews to the aircraft in the reconnaissance role only and this would become the basic 'trade' of F111K operators.

The Phantom force is a partial alternative to the cancelled P1154 project and is required initially for strike and offensive support duties. The aircraft is to have some reconnaissance capability, and eventually, the Defence Review says, Phantoms are

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to replace the Lightning force. Since the latest versions of the Lightning are still entering service one might expect another 6 - 8 years life out of them so that the air defence role of the Phantom is some way into the future. Thus the Phantom OCU should aim at turning out aircrew proficient at operating their aircraft in the strike/offensive support role. In parenthesis I would add the comment that I believe that this is not the ideal way in which to introduce crews to a new operational aircraft of this type. Experience with the Hunter force indicates that the best way to train crews to use their aircraft to its limits, and to achieve confidence in it, is to teach the techniques of air fighting at the OCU stage of training.

Having selected the primary roles of our new aircraft and concentrated on these at the OCUs the question of introducing the other skills into the force now arises. The relatively straightforward techniques of FR could probably be taught on the Phantom squadrons once crews have become operational in the primary role; however, strike or air defence techniques are much more complex and therefore special courses should be established. After, say, eighteen months to two years on a squadron, crews could return to their training establishment and take a strike course, in the case of F111K crews, or an air defence course, in the case of the Phantom crews. For operational aircrew already familiar with their aircraft these courses might not need to be longer than one month to six weeks, and would be mainly concerned with techniques and weapons. After the course, crews would return to their squadrons for a further tour of duty, of at least two years, now qualified in all the roles of which their aircraft is capable.

Two further points emerge from this suggested approach. Aircrews must be posted into the force for an unbroken period of at least four to five years and the pilot/navigator team should stick together. Only by this means can we be reasonably sure that the force will be able to realise its full potential when a crunch comes.

Secondly, we cannot afford to have the OCU as a separate entity from the operational force. Indeed there would be much to be gained in forming a central training establishment for each force which would include the OCU function, facilities for the later training courses and a standards and tactical evaluation team. This team might be responsible for helping squadrons to keep up-to-date with techniques and improve their general efficiency, whilst at the same time feeding back operational experience to the trainers.

To sum up: by drawing on our experience and adapting our flying training organization and techniques we should be able to produce the 'masterful Jacks' we require for our new generation of fighting aircraft, but I do not believe that it is practicable to try to teach all the roles simultaneously at the OCU stage. Rather, crews should be initially trained in the operational role for which the aircraft is primarily required and later they should return to the training establishment to enlarge their operational repertoire.

Any alternative views?

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"THE QUARTERLY'S" FORUM FOR DEBATE

The following commentary on WING COMMANDER I. M. PEDDER'S article

" WILL JACK BE ALRIGHT?"

was received from SQUADRON LEADER D. T. BRYANT,
R.A.F. Staff College, Bracknell.

BEFORE Wing Commander Pedder is crucified by practitioners of the "relatively straight forward technique of FR", may I support the principle that emerges from his article, that at OCU's crews should be initially trained in a single role. I disagree with some of the conclusions he draws but before so doing, I want to expand on his assumption "that our aim is to keep at least 75% of our aircraft in the front line", because I think this is the crux of the argument.

In recent years the introduction of increasingly complex aircraft has inevitably led to an increase in pilot training time. There is little that can be done about this for "first tourists" but continued adherence to the out-dated principle that the best pilots are those with broad experience has saddled the RAF with a heavy post graduate training bill. In simple terms the cost is too many operational aircraft tied up in the training role at the expense of front line squadrons. The smallness of our future Phantom and F111 force makes it imperative that this imbalance of "teeth-to-training" resources be redressed if we are to be an effective fighting service in the 1970's. Thus, whilst I do not question the obvious desirability of an extensive and comprehensive OCU training syllabus, I suggest that the provision of minimum aircraft resources at OCU's is the premise upon which the multi-role training argument must be based.

My major objection to the suggested implementation of single role training concerns the Phantom. I feel the author's military judgement has been blurred by the political inference in the 1966 Defence review that the Phantom will not be employed in the air defence role for some years to come. This may well be the plan, but in the event of an intervention, say east of Suez, would it work out that way?

Assuming that a quick reaction will normally be a feature of any such intervention, the Phantom with its excellent ferry range will be among the first aircraft to arrive. Further, assuming an air threat to our activities which through lack of recent experience we tend to ignore or under-rate, the Air Commander must initially concentrate on the security of all forces engaged in the operation. Thus, in almost any future intervention at least part of the Phantom force will be employed on air defence duties, the extent and duration of this phase depending on the quality of the opposition and the time taken to assemble and deploy a Lightning force (always assuming that

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this is a practical proposition in the area concerned). It follows that for true deployment flexibility, any Phantom force must have an air defence capability and this dictates that all pilots should first become proficient in this role before enlarging their operational repertoire as suggested.

If these two ideas, minimum OCU resources and single role training are accepted, and provided that the OCU is co-located with the other organisations Wing Commander Pedder mentions, I see the following modus operandi for Phantom or F111 OCU's. "First Tourists" receive type conversion and instruction in a single role, air defence and reconnaissance for the Phantom and F111 respectively. The unit establishment should be calculated on this task plus a small allowance for inevitable post-graduate conversions, though these must be strictly limited. However, the OCU staff should be large enough to undertake the further strike (F111), or strike and reconaissance (Phantom), tasks that will arise as and when Squadron Commanders feel their pilots are ready for this further training. Squadron aircraft would be used for this training which would be completed between the envisaged rotational overseas detachments. Squadrons based aboard pose a special problem, which could ideally be met by detaching OCU staff to the theatre thus up dating their "operational" experience. Alternatively, an agency scheme could be established, or the pilot could return to the UK. The single role principle can also be applied to the OCU's first task, that of converting "second tourists" to form complete squadrons. In this case their conversion to type would include the role or roles in which they are proficient, and one new role would be taught. This would give the across-the-board diversity of experience, aptitude and qualifications which will eventually exist in an established squadron.

In conclusion, I agree with Wing Commander Pedder that OCU training should be limited initially to a single role, not as he suggests because it is impractical to teach all the roles simultaneously but because to do so would perpetuate the present imbalance between fighting and training resources. If this should happen our potential as a fighting service in the 1970's will be severely limited.

EDITOR'S NOTE

When controversial matters are the subject of articles in this Journal, readers disagreeing with the theories or conclusions are asked to send to the Editor, by letter or commentary, their own views and/or criticisms.

If the RAF Quarterly is used as a medium for discussion and debate on matters of immediate concern to those serving in the Royal Air Force, constructive suggestions could materialize, the implementation of which might receive the serious consideration of those concerned.

Such debates would add greatly to the interest value of this Journal.

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SPACE PROJECT PRIORITIES FOR BRITAIN

By Group Captain E. A. Johnston, o.b.e.

DANIEL WEBSTER, speaking of England in 1834 as "a power which has dotted over the surface of the whole globe with her possessions and military posts, whose morning drumbeat, following the sun, and keeping company with the hours, circles the earth with one continuous and unbroken strain of the martial airs of England" could not in his wildest dreams have guessed how, a bare two life-spans later, his own America grown to be the world's leading nation would have a virtual monopoly of the uses of man-made satellites for world-wide communications. If a hundred years ago the sun never set on the British Flag, today it rises and sets sixteen times in the space of twenty-four hours upon the Stars and Stripes blazoned on the Gemini Capsule. Whilst we in Britain fumble for funds to go into space, not even perceiving as a nation why it should be necessary, the Americans, launched upon a tide of popular acceptance of space technology, have for the best part of a decade swept powerfully forward with top level commitment to objectives that stagger the imagination.

Much of the American achievement, it is true, has been caused by reaction to the challenge of Russia. From the first Sputnik onwards, the Soviet Union seems, indeed, repeatedly to have taken the edge off American achievement by the remarkable timing of its "firsts", as when Colonel Leonov stepped out of Voshkod 2 and became the first man to float freely in space, or more recently the Lunik 9 dropped gently on to the surface of the moon and told the world through its telemetered photographs that the lunar surface, rough and rocky enough to be uncomfortable for walking barefoot, was probably capable of supporting a manned spacecraft.

Ironically enough, the world was able to eavesdrop upon Lunik 9, as upon many other Russian space missions, and Britain gain kudos, only through the fortuitous existence of Manchester University's Radio Telescope at Jodrell Bank, originally funded privately for entirely different purposes in the teeth of public indifference if not opposition. Britain's purposive effort in space programmes has been small and unimpressive; what she has done has largely been done for other reasons than a coherent space policy: for example, her part in forming and progressing the European Launcher Development Organisation (ELDO) appears to have been geared more to putting a foot into the door of the Common Market than to a will to master space technology, whilst her offer of Blue Streak for development as the first stage of the Europa I project was simply the result of its deletion from the Military Armoury before ever it was fired.

But why go into space at all? It is part of man's environment, and the simple fact is that man is driven by his nature not only to increase his knowledge and under-

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standing of it, but also to find out how he can live and extend his activities into it. These extensions of a baby's contact with the nursery around him are terribly costly; but little is understood of the consequences to the economy of expenditure on space-flight. In terms not of economy alone, but also of domestic politics, international relations, social progress, military strength, even culture, the future well-being of a country hangs very closely upon the wisdom and judgement with which it makes use of technology. The yardsticks of national greatness are changing: the pace of a country's progress and achievement is measured largely in terms of its grasp of technology. Technology knows neither geographical limitations nor ideological loyalties: it cannot be a unique possession; and, more important, in the long run it is available to all who have the wit and wisdom and will to use it.

Since Sputnik burst on the world eight years ago, space has occupied a not insignificant portion of the international political arena. Manned spaceflight has been perceived almost entirely as a gladiatorial contest for prestige between the USA and USSR; there are complex international programmes of co-operation in space science and in such practical engineering applications as communication and meteorological observation; space technology has been added to the military armoury; there is a United Nations Committee on the Peaceful Uses of Outer Space; the jurisdiction of the International Telecommunications Union has been extended. Her space policy vacillating, Britain is dragged somewhat indecisively into this arena hoping somehow to obtain the maximum access to other men's treasure for the minimum entrance fee. Even the French in recent years, by embarking on an ambitious military ballistic missile programme and a modest national space programme, have overtaken the British in enterprise and potential capability. Canada and Japan are rapidly gaining competence. The President of the USA has suggested a co-operative venture with Germany to send probes to Jupiter and the Sun. If Britain is to stop sliding down the competition ladder of technological prowess she requires virile programmes of research and development at the sharp end of technology. Fifty million people cannot support themselves on a small island hand-knitting fishermen's sweaters.

The obstacle on this side of the Atlantic to ambitious space programme is, of course, the cost involved. The spur of competition with Russia, so crucial an element of American motivation, is meaningless here. There is a need for a compelling motivation to justify the vast increase of funding which Europe in general and Britain in particular can, if the need is proven, afford and must execute, if we are to contribute significantly to astronautics. The scale of Russian and American efforts indicates that only collaborative projects of the ELDO sort are likely ever to be of significance in the larger world. Small programmes like the French "DIAMANT" or the proposed British "BLACK ARROW" projects can be valuable in support of larger ones, but by themselves are of such negligible value as to be almost extravagant. Scientific probing can never alone justify adventures into space, for Science is but a means, not an end. In the final count, space is something to be used. To date, the purely scientific results accruing from the stupendously costly manned space projects have not been impressive, for the good reason that medical and engineering aspects

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have been given overriding priority in order to achieve the main aim, to get man himself fairly and squarely into the environment.

Civil space programmes fall naturally into three groups—the unmanned "working" satellites, such as the communications satellites, which perform a useful social function; the unmanned scientific probes in both near-earth and deep space; and manned space exploration. The military interest in space runs parallel, being concerned with differences more of emphasis than of principle: there is a requirement to exploit near-earth satellites for specifically military tasks in fields such as communications, navigation, meteorology, early warning, satellite interception and inspection and reconnaissance; there is a requirement to define the utility of man in the space environment; and there is an obvious direct, active interest in such space technology as has a strong potential application to defence problems—as booster and re-entry technology, satellite stabilization and materials research.

In the USA the approved budget for 1966/67 for the National Aeronautics and Space Administration (NASA) for space projects was five thousand million dollars, only slightly less than the whole of the British Defence budget. Additionally the USAF is spending about one and a half thousand million dollars a year on basic and exploratory development, of which about ten per cent is directly related to space technologies (although of course the entire research effort can contribute eventually to applications in ways that are not always forecastable), and its Manned Orbiting Laboratory (MOL) project is estimated to consume one a half thousand million dollars by 1969. These sums, astronomical as they seem to Britain, are an acknowledged strain on even the USA's financial and human resources. As a result of 1966/67 Budget restraints, the unmanned space activities of NASA have been sharply cut back to a modest but useful programme of scientific exploration and the exploitation of those working satellites having a potential economic payoff. The manned flight programmes, for Gemini and Apollo, culminating in a manned lunar landing at the end of this decade, although somewhat streamlined, have priority, and the initiation of large new tasks has been deferred until further studies and analyses can be made of the fruits of the current advanced projects and flight experience. The Advanced Orbitting Solar Observatory has been cancelled outright; the Voyager and Mariner planetary probe programme has been slowed down, and development of nuclear space propulsion is barely being kept alive.

What is particularly significant, however, is the growth of the US Launch capability as well as the potential of the industrial base associated with the Apollo project. By 1969 the programme will start to be able to launch six Saturn 1B systems (nominally capable of putting 35,000 lb. in low earth orbit) and six Saturn 5 systems (250,000 lb. in low earth orbit) annually. Saturn 5, of course, is the booster for the moon-launcher system it can put a 95,000 lb. payload into the vicinity of the moon. There will be an industrial base, moreover, for producing eight Apollo-Lunar Excursion Module (LEM) spacecraft combinations a year. Apart from the fact that these vehicles have a flexible growth potential for a wide range of manned and unmanned missions, the United States will have by 1970 a launch capacity in terms of payload some twentyfold what it is today. Known firm plans, however, involve the

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use of only a tenth of this capacity, whilst foreseeably realistic levels of funding also indicate that the surplus of space booster rocket capacity will be substantial in the early 1970s.

The lack of drive in the USA for the development of aerodynamic recoverable boosters is no doubt partly attributable to the abundance of rocket capacity. If Britain, either alone or as part of a European combine, were to gather sufficient support to initiate major space programmes, American surpluses must be a serious factor in determining the allocation of resources. Whilst rivalry in space projects demonstrably has merits, for Britain or anyone else merely to duplicate what America has done would be sheer folly. The exploitation of space is an evolutionary process; each new step must advance from preceding steps of research and flight experience as part of a balanced programme of forward movement. In this sense, Britain must advance from American foundations.

If economic payoff is to be the country's prime motivation for going into space, the most attractive bandwagon is the communications one. Although the Comsat system is owned by an international consortium, the Americans have a virtual monopoly of its space technology. In the Soviet Union a potential rival is a quasi-stationary communication satellite linking Moscow and Vladivostok. But these are only the beginning. Originally the American communications satellite system was conceived as a medium for international point-to-point radio, telephone, television and related types of traffic. The utility of satellites for domestic communications has still to be exploited. One can envisage systems of satellites vastly more highly powered than the Early Birds, sending video and voice directly into home receivers; in such a bonanza commercial field it would be sad to perpetuate, through default, an American monopoly. There is enormous scope over the next decade for enhancing the quality and reliability and life-expectancy of the "working" satellites systems, which, married to computer technology, are bound to become routine extensions of human intelligence because they will be doing a needed job that can best be done on a planetary scale.

It is when reliability and life-expectation are seriously considered that the economic justification for putting men into space is pleaded. Unmanned satellites are by far the cheapest and most efficient way of performing certain specific tasks, but there seem to be circumstances when putting men into the loop does offer quantitative improvements. Perhaps only complex tasks will require men. The coin in which man is most likely to pay for his place in space is his ability to deal with the unexpected, although the possibilities must be largely foreseen if a limited crew with limited facilities is to handle such arisings. There are six significant tasks which seem particularly suited to man rather than machines: assembly and fine adjustment of equipment, flight plan reprogramming during orbital flight, maintenance and repair, data screening and selective reporting of significant data. But complex missions may be difficult to do with a small group however well trained: for example, over six hundred highly educated and skilled people are needed in the launching of two astronauts in a single Gemini. Any useful manned space system—which will be very expensive indeed—must be a careful match of man's general abilities, automatic

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equipment on board the space craft and on the ground, and the nature of the mission.

Military interest in space is likely to be focussed on near-earth missions, out to synchronous orbit, certainly for the next ten years. Space is not a medium in which a serious threat of aggression exists, despite much bombast and imaginative writing, for it is neither military nor economic sense to put bombs into orbit either as an overt threat or as a counter-deterrent. They are much more effectively and credibly commanded, deployed and controlled on the ground or under the sea, as well as cheaper by several orders. It is nevertheless necessary to have the ability to observe and compute and record all satellite activity and to develop techniques and systems for inspection if not actual destruction, so as not to be caught out.

There are probably no military missions uniquely requiring man's presence in space. In the USA the first aim of the Manned Orbiting Laboratory (MOL) project is simply to learn more about what man is able to do in space and how this ability can be used for military purposes. For many years the USAF has pleaded for an opportunity to gain "operational experience" in space. This policy does not embrace the deployment of weapons in orbit, but does include as objectives for manned military space stations various categories of reconnaissance and surveillance, inspection of unknown space vehicles and command and control of ground, sea and air forces.

With all the steadily increasing know-how from both the civil and military projects it will not be long before there will be a routine capability of rendezvous, station-keeping, docking and transference of men and materials, as well as of sustenance of men in space for usefully long periods, all allied to "quick-reacting" booster systems. It is not so much booster capability that will put a ceiling on the possibilities, as the cost of boosters and payloads. The Titan 3 is expected to halve the present direct costs of more than one thousand dollars per pound payload launched into low orbit, and plans for later generations of expendable boosters show promise of reduction to as little as one hundred dollars per pound; but the military requirement for frequent, routine and rapidly reacting operations implies, logically, even further reductions, which only recoverable boosters can provide. There is a military requirement too, for re-entry bodies capable of manoeuvring within the atmosphere to a guided landing.

Extensive detailed studies have been made to confirm the feasibility of exploiting the elements of the Apollo system, with suitably modified equipment, to carry out a variety of missions in earth orbit, lunar orbit and on the lunar surface without prejudice to the prime objective of landing a man on the moon. The sheer variety of the experimental programmes which have been drawn up and co-ordinated by NASA leaves the outsider wondering what scope there can possibly be in space for a third party: they include earth mapping in the visible and near-visible spectrum, studies of X-ray, visual and infra-red spectral and photometric data, studies of zero-gravity behaviour of biological systems, solids, liquids and gasses as well as the effects of prolonged weightlessness on men, the evaluation of human performance in a rotating environment (i.e. artificial gravity), radio astronomy, the investigation of aurora, magnetic fields, micro-meteoroid fluxes and gamma rays, life support, communica-

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tions, rendezvous and transfer. Since the MOL is complimentary to Apollo, civilian NASA plans for greatly extended manned orbital excursions must to some extent depend on the results of the MOL programme.

Beyond the currently active projects and these interim applications of Apollo lie the vague prospects of the next generation's goals. It is perhaps too early to be thinking seriously about a manned expedition to Mars (probably beyond both the financial and technical resources of one country, even so powerful as the USA); nevertheless, during the latter half of this decade decisions will have to be made about commitments to new long term major projects. Recoverable orbital transports, a large permanent space laboratory, permanent lunar bases, ever more sophisticated planetary exploration, direct broadcast video satellites in synchronous orbit, continuous global weather observation and forecasting systems, solar and galactic probes, and the development of nuclear and electric engines are likely to contend for funds. In a presentation to the US Senate Space Committee in September, 1965, the head of NASA's Manned Spaceflight programme, Dr. G. E. Mueller, summarised the options available to the USA in the post-Apollo era, having regard to the human resources available and realistic levels of financing. They were:

> To seek a direct economic payoff from near-earth "working" satellites, enhancing their effectiveness by adding crews where necessary; or
>
> To extend the goal of Apollo to encompass a complete programme of lunar reconnaissance, mapping, establishment of bases and exploitation of the moon's resources whatever they may be; or
>
> To concentrate on exploration of the solar system with emphasis on early landing of men on a planet; or
>
> To attempt to achieve the above tasks in all three fields as soon as technically feasible; or
>
> To pursue a balanced programme seeking basic goals in all three fields in a timescale commensurate with the support that can reasonably be provided.

The fourth option is clearly a crash programme requiring a maximization of effort far transcending a one-nation capability; it could be fantastically expensive. Each of the first three options, while probably being within the reasonable capability of the USA, is about equally contentious when it comes to the point of making a choice. The last commands support because it is flexible and potentially the least chauvinistic.

From this survey of the American scene, two broad conclusions follow. Russia apart, any non-American space programme can only be conceived upon the body of what USA has already done and has the potential to initiate in the future, so primitive by comparison is the state of the art elsewhere. And the only long-term projects likely to grip the imagination sufficiently to command the necessary support are beyond Britain's single-handed capacity to execute. Russian capabilities have, unfortunately, to be ignored because of the secrecy shrouding their projects on the one hand and the political barriers, for the foreseeable future, to significant technical collaboration on the other.

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This is not to conclude that the only courses available to the rest of the world are either to give up or to participate as subordinate partners in future American projects. Far from it. If one takes as one's basic political assumption a close association between Britain and Western Europe in the years ahead, one can deduce that her space activities should ultimately take place at three levels: first, the purely national programme, necessarily small in scope, consisting of scientific probing by and on behalf of Universities and the Research elements in Industry; second, participation in a primarily Western European programme, more or less in competition with USA and the Soviet Union on projects of intermediate size having in the main a real or potential economic payoff; and third, participation in what could be a global programme—that is to say, as part of a European consortium in collaboration with USA on some of the vaster next generation projects. But whatever the ultimate groupings, bilateral collaboration with the USA, today, is the prerequisite to getting going at all. To begin with, therefore, Britain must both seek expanded collaboration with the Americans and strive to lead Western Europe into virile activity.

Fortunately the USA itself is alive to the importance of international co-operation for the more ambitious enterprises. Towards the end of 1965 the President held a major conference in the White House on International Co-operation; one of its thirty committees dealt with co-operation in space. Recognizing the limits imposed on the national programme by the prospect of a ceiling of five billion dollars on the NASA budget for some years ahead, this Committee recommended a number of space projects for international cost-sharing; new equatorial launching sites to simplify putting synchronous satellites into orbit; the development of multipurpose navigation satellites—for marine and aircraft navigation, air traffic control and distress and rescue communications; a worldwide weather service; co-ordination of sounding rocket programmes investigating the high atmosphere; and a vast expansion of communications satellite facilities for public, government and industrial use.

Of all the space projects to which it is possible for Britain to apply funds there are two of sufficient importance to command popular support, and of interest to both the Civil and the Military—namely, putting man into space, and global communications systems. Whilst for the latter, no doubt, a financier's case can be made, the former involves an act of faith: its consumption is inevitable, and it really does not matter what excuse is used for getting him there—lunar exploration, biomedical research or military utility. In terms of practical programmes, however, the immediate choice can only be between MOL and some offshoot of Apollo. The European Conference on Telecommunications Satellites (ECTS), which is concerned with European participation in the operation of a worldwide civil communication satellite system, could well become the forum for initiating an ambitious native European project.

Since commercial communications are the lifeblood of an advanced industrial economy, and since the growth of Britain's prosperity is acknowledged to depend on ever closer political and economic ties with Western Europe, top priority amongst space projects should be given by Britain to initiating joint European development of a complete communication satellite system based initially on the use of American

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boosters. The programme must nevertheless include development of new low-cost launching techniques.

This would leave the Military to become the national agent for the second priority programme, exploration by human beings of the frontiers of their environment. It is after all a classic military mission, and absolutely in the tradition of an Air Force which until a few years ago held pride of place amongst those who flew highest and fastest and furthest. In view of the limitations of the MOL programme itself, the security problem of participating in foreign military programmes and the national need to derive the broadest benefits from its investment, the best course to pursue towards the ultimate objective of participating as experts in our own right in global next-generation projects would be to endeavour to commit ourselves jointly on a major financial scale with the Americans to one or other of the extensions of the Apollo programme. One can envisage a growing British participation leading, for example, in the mid-seventies to an all British operating capability founded on American space modules jointly equipped, and perhaps launched by new recoverable boosters developed mainly by the British—many variations of this theme are possible. The balance which needs to be struck between total and national military needs can only be found empirically. By playing a substantial part in advancing the rate at which Dr. Mueller's fifth post-Apollo option could be advanced, Britain would not only help to render the American effort more efficient, but also learn quickly to stand on her own feet while deriving the maximum technological benefit from a broadly based programme. As executors of the national manned space programme, the Defence Forces would lead the way as they always have led through the history of flight to push back the frontiers of man's operational environment. It has to be done.

[*This article was awarded the First Prize in the 1966 Gordon Shephard Memorial Prize Essay Competition.*]

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A FURTHER REPORT FROM THE AMNESIAN FRONT

By Air Vice-Marshal C. N. Foxley-Norris, C.B., D.S.O., O.B.E., M.A.

RECENT global developments in the military sphere and, closer to home, in the field of defence policy in the United Kingdom have to some extent distracted attention from the conduct of similar affairs in the well-known South Pacific kingdom of Amnesia. However, comparisons at any level are always valuable, and readers of this Journal may find some practical or philosophic interest in learning of how matters have been going there lately. As always, the record of proceedings in the Electoral House, particularly during question-time, provides us with the most fertile source of information, other than the classified Amnesian Ministry of Self-Defence files which, although readily available on the market, are currently priced above the pocket of the average serviceman.

Here are some extracts from Question-Time; the Minister was in his usual trenchant form.

Nomenclature of Ministry (from the Opposition).

Q. Can the Minister tell us why, under the latest re-organisation, it has been found necessary to alter the title of the Ministry from Defence to Self-Defence? Are we merely slavishly following the nomenclature of the Japanese "self-defence force?"

A. Certainly not, Sir. This new name derives from experience. The experience of our armed forces and their Ministry is that whenever our beloved country by pure mischance runs into serious economic difficulty, an immediate attack follows on the defence budget and establishment. All our staffs, indifferent of course to any possible effect on their own position or emolument but utterly loyal to the mother Ministry (Alma Materialistica), rush enthusiastically to her defence. As a natural result of recent trends, alas only too common everywhere today, towards national bankruptcy, the staffs in fact spend far the greater part of their time on such activity.

It is for this very logical reason that the new name for the Ministry has been adopted and I am quite confident that in the future the decision will prove thoroughly, indeed constantly justified.

Cancellation of Major Defence Projects (from the Government back-benches).

Q. We have all been very concerned about the number of incidents, well publicized of course in the Press to whom good news is no news, where major projects and equipments in the Defence field have been cancelled. Everyone apprec-

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iates that with rapid changes in foreign policy and economic circumstances, some consequent changes in Defence matters are inevitable. But such changes always seem to come so late in the game that enormous waste of money is involved. Is it not possible to accelerate the process so that earlier decisions are taken and less financial loss involved?

A. Indeed it is, Sir, and we have a most promising solution in hand (otherwise I would not have asked you to put this question). We are proposing nothing less than a complete reversal of procurement procedure. In the past, after a paltry few years of inquiry and evasion, we have reluctantly accepted certain proposals and thereby initiated the whole costly process of military supply. For the future, by contrast, we propose automatically to reject any major proposal for military equipment submitted by the Services until we can be sure that it is in any case so late that the equipment, even if provided, would be obsolete. By applying this principle huge economies can be made and all those in authority are being instructed to introduce it without delay and without exception.

Q. That is most welcome news, Sir. May one enquire what name will be given to this splendid new principle?

A. Yes, Sir. It will be called " The Need to No." (Applause).

Militarization of the Civil Service (from a cross-bencher).

Q. Rumours, Sir, have recently been rife that certain elements of the Civil Service are to be militarized and that certain traditional responsibilities of that Service are to be handed over to the brutal and licentious. A denial of these rumours, or, if they are well-founded, an explanation, is urgently needed. Sir, can you tell the House — what is afoot?

A. Eschewing the obvious humorous retort of " Twelve inches " or " Something you put in a bloody boot," which would doubtless have sycophantic Government members rolling in the aisles, I have to tell you that we do indeed have some such proposal in mind. We plan extensive and widespread transfer of civil service posts to the military. You ask for an explanation, Sir; I should have thought none was necessary. It should be obvious to the veriest political virgin what we are up to. The armed forces outnumber the civil service; therefore they represent more votes; therefore they must be looked after. Next question?

Overseas Bases (from the Opposition).

Q. Could the Minister favour the house with a statement on the rundown of overseas military bases, in particular the joint-service base at Chantarich? And what steps are being taken to ensure that our overseas capability is not being irreparably repaired by the closures proposed in the Self-Defence Revue?

A. This is an awkward subject, which I will do my best to clothe in such complicated and abstruse verbiage as to make it unintelligible to the man-in-the-street, let alone the cloth-heads opposite. Briefly, we allowed ourselves to be swept away on the tide of the glorious anti-coloniast crusade and promised to liberate Chantarich

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at an early date, which naturally involved also the removal of our garrison and the decay of our enormously costly military installations. I will not disguise from the House that this step aroused considerable opposition from several quarters. Not only did our Service diehards claim that our defence posture in the area and our capability to support our allies and maintain our interests would be seriously impaired; but the ruler of Chantarich even had the audacity to suggest that the dismantlement of our base and the departure of our troops would disastrously impair his country's economy, to the extent that a large proportion of the population would perish of partial malnutrition — "starve" was I believe the unpolished word employed. Representatives will however not be surprised to hear that His Radiance's government stood none of that nonsense and rejected such arguments out of hand.

Q. (a voice): And what happened in the end?

A. I will not disguise the deplorable fact that matters did not eventuate entirely as forecast. Surprisingly, there appeared to be some minimum validity in the arguments of the Joint Staffs and retired officers, so much so that we have been compelled to improvise in some haste alternative military facilities on the neighbouring island of Deaddio. Gentlemen opposite who find something humorous in this statement may be assured that maximum economy and austerity were applied to the design and construction of the replacement facilities. Indeed their cost was less than 90% of that of the original installations — taking account of course of some degree of inflation since the latter were provided in the early 1920's.

As for the population of Chantarich, the majority consented to transfer to the new base (not without some pressure, I must admit) and continue their valuable work there. For the remainder the threat of starvation proved unfounded in the event.

Q. (the same voice): How come?

A. As luck would have it, it proved necessary to establish weapons ranges for guns, bombs, rockets and so on to train our newly-assigned offensive forces in Deaddio; and our redundant installations at Chantarich provided ideal opportunity targets. Those of the original indigenous inhabitants of Chantarich who had obdurately remained there soon had little cause to concern themselves with malnutrition: and thus, if I may coin a phrase, a number of birds were killed with the minimum expenditure of stones. Advance Amnesia! Are there any further questions?

There being none, Opposition representatives were duly manacled and returned to their cells, and the session was formally closed.

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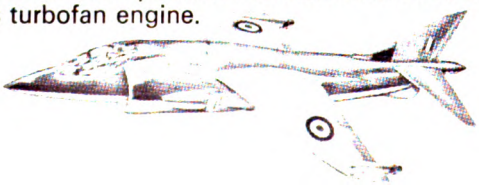

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ALLIED FORCES NORTHERN EUROPE

By Wing Commander J. G. Duncan, o.b.e., m.a.

I — HISTORICAL

IT is now 18 years since Norway and Denmark joined NATO, and consequently it is rather easy to forget the revolution in their political thinking which this event signified. Two things caused the change: their experiences in World War II, and the implications of the 1948 Communist coup in Czechoslovakia.

In 1940, Denmark had enjoyed peace for 76 years, and Norway for 126 years. The tradition of neutrality which developed in the two countries became the deliberate policy of their Governments.

When the North Atlantic Treaty was drafted, Denmark and Norway were invited to join. But first, the Governments of both countries examined the idea of a Scandinavian Defence Union, between Norway, Sweden and Denmark. This was an attractive idea for those countries, which have so much in common, but the attempt to carry it out failed. Sweden insisted that the Union should stand as a neutral force between East and West, whilst Norway wished to link in some way with the Western powers. The two viewpoints were irreconcilable; and while Sweden chose to maintain her neutrality, Norway and Denmark decided to join NATO.

Because Norway has a common border with Russia, there were further political influences upon her membership of the alliance, and on her military situation.

In 1949 there was an exchange of diplomatic notes between the Russian and Norwegian Governments. The two countries had always been friendly, and Russia protested against Norway's intentions. The Norwegian Government replied very firmly that it was not going to be deflected from joining NATO: it did, however, state that Norway would not allow foreign bases to be established on her territory in peace-time, unless there was a threat of war against her. This pledge is taken very seriously by Norway; and although no similar pledge was given by the Danish Government, Denmark has pursued a similar policy.

A further effect of this pressure is that no stocks of atomic ammunition are allowed to be held in Norway or Denmark "under the present circumstances". The military value of such weapons is not contested, and the two countries might accept their entry should they consider themselves threatened in sufficient degree

The significant conclusion from these facts is that NEC relies to an important extent on the timely arrival of external supporting forces. Particular interest accordingly attaches to the Allied Mobile Force. This has a land and an air component, both of which have undertaken exercises in Northern Europe Command. Additionally, of course, the deployment of the AMF (L or A) in time of real emergency, would in itself constitute a demonstration of NATO unity and determination.

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II — GEOGRAPHICAL

Northern European Command comprises Schleswig-Holstein as well as Denmark and Norway. The distance between its northern and southern borders is no less than 1200 miles. The range of climate and topography is also great—temperate plains in Germany and Denmark; rugged mountains throughout most of Norway, and in the far north, the more level but bleak area of Finnmark, well within the Arctic circle.

The length of Norway itself is not always readily appreciated. If pivoted about its southern tip, its northern tip would reach beyond Rome. Its coast-line, if straightened out, would reach more than half way round the world. Add to this the fact that communications in all but the south are extremely poor, and the magnitude of the defence problem can be begun to be imagined.

Both extremities of the Command (Finnmark and Schleswig-Holstein) border the Iron Curtain; in the middle is the entrance to the Baltic, and Copenhagen is only a few minutes' flying time from Soviet occupied territory. The northern half of the Command lies in the direct air route from western Russia to North America.

The total population of the three national elements of NEC (Norway, Denmark and Schleswig-Holstein) is only 10.5 millions, and although Norway and Denmark together spend about £190 millions annually on defence, the man-power and resources thus available are small in relation to the military problem. This would be less significant were it not for the political restrictions on augmentation of the forces, referred to in the Historical Section above.

III — MILITARY

This section will be sub-divided into three parts: A. The Headquarters, B. The Command and C. Forces. The land and sea forces will be covered in rather less detail than the air forces.

A. *The Headquarters*: HQ AFNORTH was initially formed in London early in 1951, but within a few months was established at a location near Holmenkollen, north of Oslo. The present HQ, which was specially built in 1953 is at KOLSAS, about 12 miles west of Oslo. Until 1st January, 1963, there were three separate commands (AIRNORTH and NAVNORTH under AFNORTH), but since that date there has existed a unified tri-service Headquarters.

On the staff are Norwegian, Danish, German, American and British officers, of all three services. The CINC is normally a British General; the Deputy CINC/Air Deputy is a Lieutenant General from either the RNAF or the RDAF, the Vice Air Deputy is a USAF Major General, the Land Deputy is a Danish/Norwegian army Major General, and the Naval Deputy is a British Rear Admiral. The Chief of Staff is a British Major General, and the arrangement of Staff Divisions is as shown on the accompanying diagram *Fig. 1*.

In peacetime, the HQ is mainly concerned with planning for war and with conducting exercises. The bulk of the forces are assigned during the NATO Alert process. In war, command would be exercised through the principal subordinate commanders. The air forces are, however, in a special position. CINCNORTH has command of

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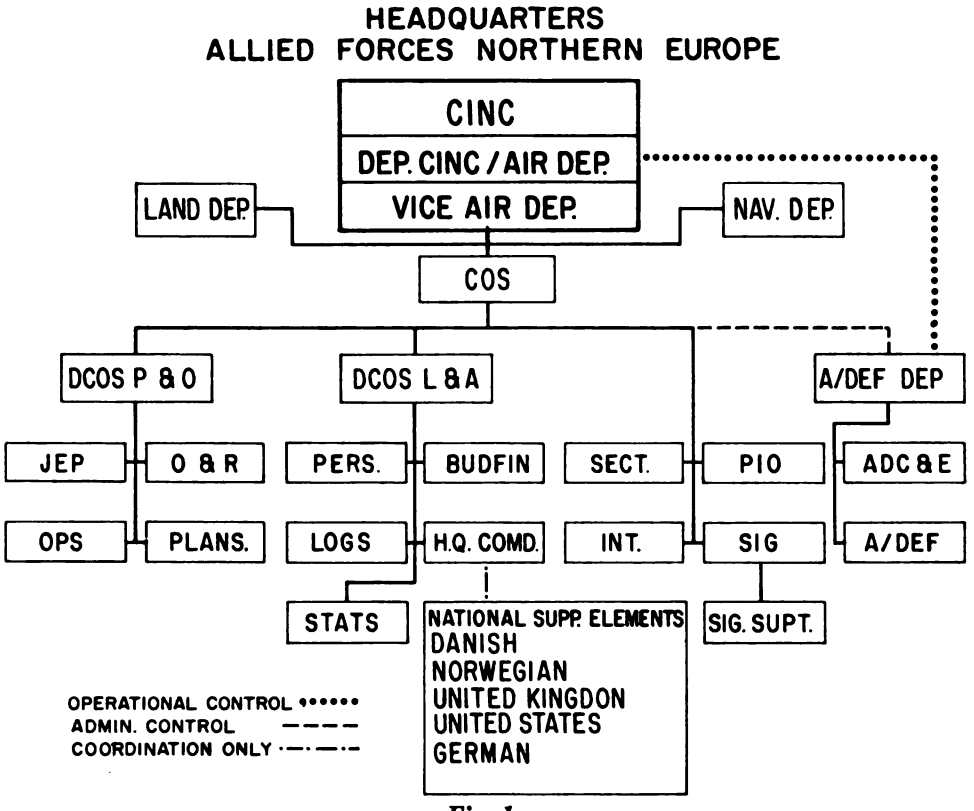

Fig. 1

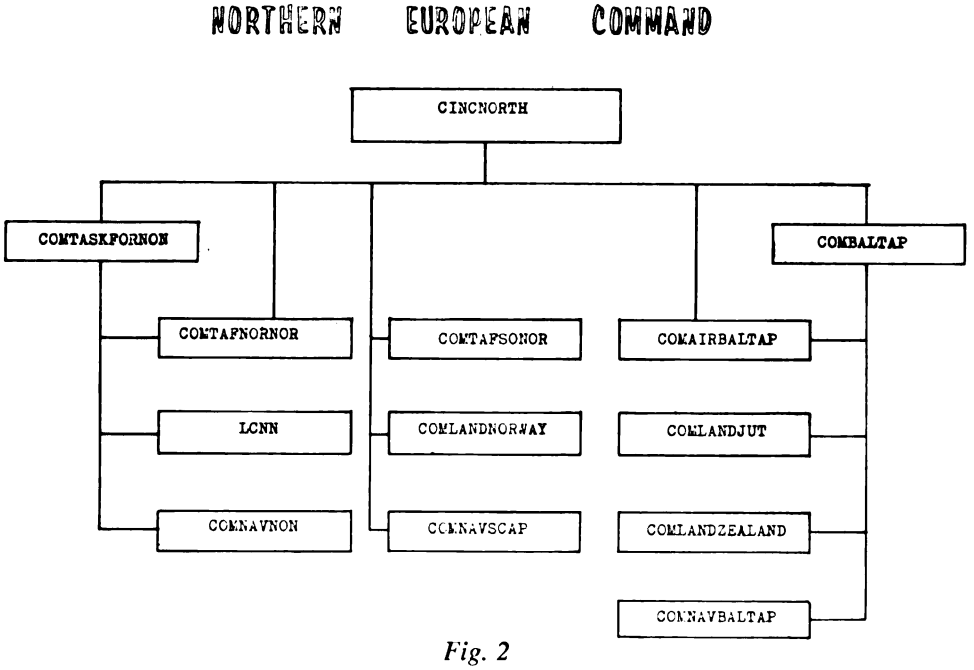

Fig. 2

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the air defence forces of the area in peace-time, and assumes command of all air forces when they are assigned in war-time. This is exercised through the Air Deputy, who is thus unique in being an operational commander, whereas the other two Deputies have no command functions.

B. *The Command*: NEC is divided into three tactically separate but inter-dependent areas: North Norway, South Norway, and the Baltic Area comprising Denmark and Schleswig-Holstein.

The remoteness of North Norway has demanded the establishment of a separate subordinate formation there. It is headed by the Commander Task Force North Norway (COMTASKFORNON), who has under him, land, sea and air forces. In peace-time he is a national commander with certain allied functions. In war, he comes under the command of CINCNORTH.

South Norway is less exposed to immediate invasion than are the extremities of the Command, and receives considerable protection from the BALTAP forces. In South Norway there are separate commanders for land, sea and air, COMLANDNORWAY having an allied HQ in peace. A unified command, with a tri-service commander directly responsible to CINCNORTH, has been under consideration for some time.

In the Baltic Area, COMBALTAP is an allied commander in peace, with a tri-service organisation. The land command is a dual one, covering Jutland and Zealand. The accompanying diagram *Fig. 2* shows the whole structure of the Command.

C. *Forces*: Military training in Denmark and Norway is based on general conscription, although in both countries a certain number of regulars are recruited for special tasks. In Norway the service period is 12 months for the army, and 15 months for the air force and navy. In Denmark the service period is 14 to 16 months. In Germany the initial service period for the army is 18 months, while air force and navy personnel are mainly recruited from volunteers.

Most of the area, particularly Denmark, is well furnished with airfields, several of which have been developed with the aid of NATO infrastructure funding. In North Norway, airfield construction is naturally more difficult, but four have been built. Two of these are very active, and two used less intensively except during exercises.

The severe weather in the north has less adverse effect on flying operations than might be supposed. The locations of the airfields are such that their environmental weather differs widely. Bardufoss for example, has typical inland conditions, whereas Andöya and Bodö have coastal conditions, but each different by reason of their relationship to the off-shore islands. Hence there is usually a diversion airfield available. In fact, these airfields go "out" for weather surprisingly rarely.

Runway snow is scraped down to a thin level, then pressed. Braking action on such a surface is reasonably good. The technique of dealing with ice is to sand half the runway width. Hot sand, and, in the lowest temperatures, flame-throwers, are used. Thus half the runway is roughened for landing, leaving the other half sand-free for take-off. Except in severe cross-winds, these forms of airfield management work well.

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There are two further regional problems. The seasonal succession of short days and short nights restricts the time available for daylight flying training in winter, and for night work in summer. Secondly, aircraft and equipment on the coastal bases suffer from the effects of sea-salt corrosion.

This is not the medium for setting forth the NEC order of battle. However, it can be stated that the following types of aircraft are in operational service: G91, RF84F, F86K, F100D/F, F104G, Hunter, Hu-16B (Albatross) and C119G. New types now entering service are the F5 and the Atlantique. The defence of the two capitals is augmented by missile installations: Hawk and Nike in the Copenhagen area, and Nike in the Oslo area.

F.5 Aircraft of Royal Norwegian Air Force over Norway (*A.F.N.E. Photo*)

In relation to the size of the area and to the magnitude of the potential threat, the forces available to defend NEC are small. However, training is consistent and conscientious, operational plans are well developed, and morale is good. The professional standards of the air forces are as high as can be found anywhere.

It is almost superfluous to point out in conclusion, to readers of the Royal Air Forces Quarterly, that the exercise of air power in the NEC environment, affords excellent examples of its classical characteristics of flexibility, mobility and speed of reaction.

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RAF BUYS DECCA LORAN C/A

A contract has been signed by the Ministry of Aviation for the supply of Loran C/A navigational equipment to the Royal Air Force. The contract, which is estimated to be worth approximately one million pounds, represents not only a saving of over two million pounds to the British taxpayer but also a saving in dollar expenditure. This contract was won in the face of stiff American competition. The Decca Navigator Company Limited will supply approximately 200 sets of equipment at less than one third of the price which would have been charged by their American competitors. Delivery of the equipment will commence in January 1967—less than one year from the initial discussions on the project and will be used for long range navigation by Royal Air Force C-130K, VC.10, HS.801 and Belfast aircraft.

The equipment has been designed by The Decca Navigator Company Limited, acknowledged world leaders in hyperbolic navigation systems, who not only hold basic patents on the Loran system, but have already supplied Loran equipment to the U.S. Navy.

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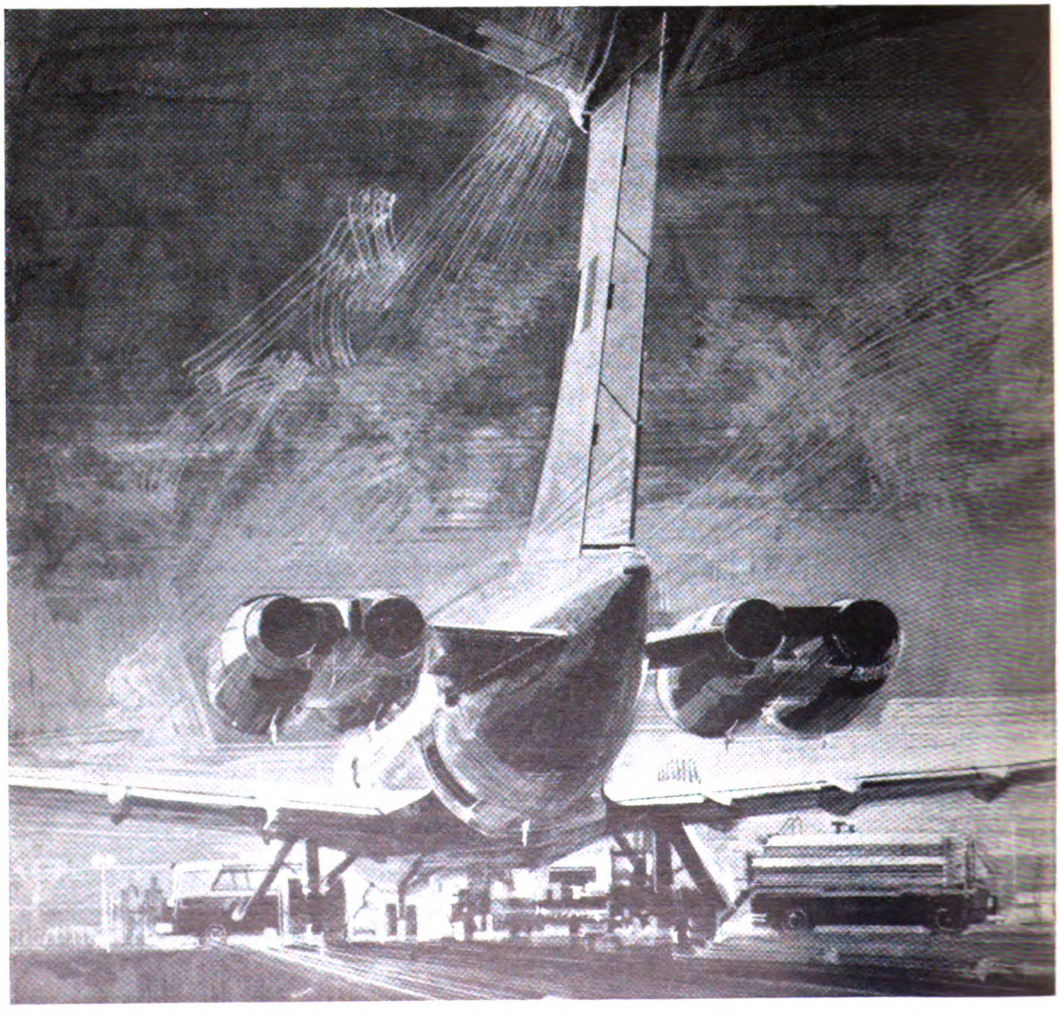

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R.A.A.F. EXPANSION CONTINUES

By A Special Correspondent

Chief of the Air Staff,
Royal Australian Air Force,
AIR MARSHAL SIR ALISTER MURDOCH, C.B., C.B.E.
(RAAF Photo)

THE Royal Australian Air Force contribution to Australian operations in South Vietnam more than doubled in 1966.

Within Australia, the rapid expansion continues as the Force prepares for the new bombers, air transports, jet training aircraft and maritime reconnaissance aircraft which, together with the Mirage supersonic fighters already in service and new support equipment and facilities, will soon transform the R.A.A.F. into one of the most potent deterrent air forces of the smaller nations of the world.

Air power depends not only on the best available air weapons but on the provision of highly skilled air and ground crews, well equipped airfields in areas of strategic importance, modern radar, maintenance, supply and transport together with reserves of fuel, ammunition and essential stores. These the R.A.A.F. is providing as the new aircraft come into service.

The R.A.A.F. Component of the Australian Force, Vietnam, now actively engaged in operations comprises two squadrons (one of helicopters and one of transports) a small headquarters element, including an Air Transport Operations Centre and a Base Support Flight. The Squadrons are No. 9 equipped with Iroquois helicopters and No. 35, formed from the nucleus of the R.A.A.F. Caribou Transport Flight which has flown continually in Vietnam since July, 1964.

The R.A.A.F. Iroquois helicopters in Vietnam have operated in support of Australian troops in action and evacuated the wounded from the fighting areas to Vung Tau.

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Transport

The heavy air transport commitments of the R.A.A.F. made necessary the formation of two new squadrons — No. 35 Caribou Squadron in Vietnam and No. 37 Hercules Squadron which is now in process of taking delivery of 12 new Hercules C130E aircraft. These new transports have a greater payload and longer range than the Hercules already in service.

No. 36 Hercules Squadron based at R.A.A.F. Base, Richmond, and No. 35 Squadron, which is under the operational control of Australian Task Force, Vietnam, are operating in support of the Australian effort in Vietnam. Additional transport support is provided in the forward areas by the Iroquois helicopters.

In support of the Malaysian defence effort a detachment of R.A.A.F. Sabre jet fighters took part for two months (October - December, 1965) in operations in Borneo. The Sabres were drawn from the No. 78 Sabre wing at Butterworth where the R.A.A.F. has maintained Sabres since 1958. This wing of two squadrons, together with No. 2 Canberra Bomber Squadron are part of the R.A.A.F. contribution to the Commonwealth Strategic Reserve in Malaysia and continue to maintain a high state of operational readiness.

5 Squadron Home

No. 5 Helicopter Squadron which supported security operations in Malaya was withdrawn to Australia. The move of this squadron was made following consultation with the Malaysian Government.

A detachment of Mirage fighters was deployed to Darwin where it joined a Bloodhound ground-to-air missile detachment in the air defence of the Northern Territory.

Large scale operational exercises involving all major aircraft in the R.A.A.F. were carried out during the year in Australia. Units of the United States Air Force, Royal New Zealand Air Force and R.A.A.F. combined in "Operation Pacific Concord I", one of the biggest tactical air exercises ever mounted in Australia.

The decision was made to modify six of the twenty-four F-111A variable-wing strike aircraft on order to the R.A.A.F. as reconnaissance aircraft. The decision will completely revolutionise the Force's reconnaissance capability.

The R.A.A.F. will take delivery of all F-111As on order as originally planned between July and November, 1968. However, early in 1970, six of the aircraft will be flown back to the United States to be fitted out with advanced electronic equipment including sensors, cameras, radar and infra-red which will make possible all weather and night reconnaissance operations.

To guard against the threat of sabotage or attack by individual enemy regulars, partisans or guerrillas, the R.A.A.F. has introduced a new mustering of Airfield Defence Guard.

The role of the Airfield Defence Guard is the defence of aircraft, operational equipment, facilities and personnel in the South-East Asia areas against these forms of attack. Members of the new force were posted to Vietnam and Thailand at the end of August.

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Ret.)

PARLIAMENT adjourned for the Christmas Recess on 21st December, 1966, and will re-assemble on 17th January, 1967, unless it is specially recalled earlier in an emergency.

As usual, the debate on the motion for the adjournment in the House of Commons on 20th December provided the opportunity for many hon. members to express their disapproval of the Government's policy on a variety of matters; and incidentally showed how ingeniously the members contrived to voice their grievances—sometimes at considerable length—in ways that could hardly be regarded as relevant to the motion before the House, which was "that this House, on its rising tomorrow, do adjourn until 17th January, 1967." In fact the Speaker (and the Deputy Speaker in his absence) had repeatedly to call hon. members to order for making observations which were not, or appeared not to be, relevant to the question of whether or not the House should suspend its sessions for twenty-six consecutive days. Those who opposed the motion did so because they feared that Her Majesty's Government might—and probably would—get up to some tricks of policy or administration during the recess when they (the Government) would not be immediately answerable to Parliament (as the Constitution provides) and when Ministers of the Crown would not have to justify their several policies and actions in reply to Questions in the House.

The matters which hon. members said they were not satisfied to leave to the unchallenged decisions of the Government, in the absence of the restraining influence of Parliament, were numerous and they covered a wide field. Defence and the armed forces were not among the topics discussed; but they were indirectly and inevitably involved in several of them, notably the war in Vietnam, the Rhodesian situation, and Aden. These are dealt with below.

Vietnam

Mr. Eric S. Heffer introduced the subject of Vietnam; and he was supported by Stanley Orme, Michael Foot, John Boyd-Carpenter, Ray Newby, Tam Dalzell and Hugh Jenkins. Mr. Heffer reiterated the common demand for a peaceful settlement of the dispute in Vietnam. He deplored, as nearly everyone does, the bombing of North Vietnam by the United States Air Force, especially when it involved civilian casualties even by accident; and particularly when the Americans were calling for a conference to settle the dispute. He quoted the *New York Times*, which had pointed out the dangers inherent in the bombing of Hanoi and had stated that peace moves

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made in the past by the Government of North Vietnam had been repulsed by the American Government. The Labour Party Conference, he reminded the House, had passed a resolution calling upon the British Government to dissociate themselves from American policy in Vietnam; but, he added, this had not been done. United States forces in South Vietnam had been steadily increasing and they now amounted to nearly 400,000 men. It was understood that the United States Government had recently placed a contract (internally) for napalm to the enormous extent of three pounds weight per person in Vietnam. Mr. Goldberg's appeal to U Thant to mediate in the dispute had been stultified by the continuation of bombing; and there was always the danger of Laos, Cambodia and Thailand becoming involved. The more extreme advocates of a peaceful settlement demanded the immediate withdrawal of all American troops from South Vietnam. All this, it was suggested, pointed to a danger of escalation into a major war, even to the possibility of a world war with nuclear weapons.

At a recent meeting of the Western European Union, a resolution had been passed calling for peace in Vietnam; but none of the members of that body who were interested in Vietnam had done anything to bring this about. Mr. Boyd-Carpenter, while deploring the continued bombing of North Vietnam, did not wish to see the Anglo-American alliance broken up by precipitate or ill-advised action on our part; and he suggested that the American policy in Vietnam was another example of "brinkmanship", such as that of Mr. John Foster Dulles, which was supposed to enable the U.S.A. to negotiate from strength and not to appear so eager for a settlement as to sacrifice important principles, *e.g.* the right of the South Vietnamese to choose the form of government they wanted.

A disinterested view of the present political situation in South-East Asia generally, and in Vietnam in particular, reveals certain fundamental facts. The Americans are pledged to prevent the spread of communism in South-East Asia, and that is one of the reasons for their support of the South Vietnamese against the North. Their other reason is the one they inherited from President Woodrow Wilson, namely the right of every nation-state to adopt the form of government which it prefers. These two aims are not necessarily compatible; for if South Vietnam were persuaded, by any legitimate means, to accept a communist form of government, they might reasonably be allowed to do so. Yet it is in the interests of both the United States and Britain to oppose the spread of communism in South-East Asia; because we believe that it would be detrimental to the nations concerned as well as to ourselves. Australia, New Zealand, Malaysia and Singapore have similar views; and the Australians are helping the Americans in Vietnam practically. British forces, with the moral support of the United States, have successfully prevented the spread of Indonesian quasi-communism into Malaysia; and we, for our part, lend moral support to the United States in their war in Vietnam. It would perhaps be unfair to contrast our success in Borneo with the so far unsuccessful operations of the Americans in Vietnam, for the circumstances are very different. Yet it is difficult to avoid the conclusion that American troops could still learn something about guerrilla warfare in those parts from us.

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As to the danger of escalation, this can, it seems, be exaggerated. It all depends on China—with or without nuclear weapons. And the Chinese are not fools. They will do nothing that will bring disaster upon themselves. Why should they? They are content to allow the war in Vietnam to continue as at present indefinitely and to encourage the North Vietnamese in their attempt to impose communism on the South Vietnamese; because that would help to protect the Chinese People's Republic from anti-communist influence. And so the war goes on. The Americans have declared that they will pursue it to the bitter end: that is until they win. But can they win? The strength of the North Vietnamese is that they can afford to wait indefinitely, in the not unreasonable hope that the Americans will eventually get tired of a war that seems to be endless and withdraw their troops. This is indeed possible but unlikely. So we must be prepared to see hostilities continue for a long, long time; and no one can prophesy, with any assurance, what the outcome will be. If the Americans were to withdraw at any time without achieving decisive victory, the North Vietnamese would certainly occupy South Vietnam and establish a communist state therein. All the gallant United States efforts would then have been in vain; so they must go on, but for how long no one can say.

Rhodesia

Mr. Ray Newby pointed out the inconsistency of trying to stop the war in Vietnam while taking measures which might precipitate a war over Rhodesia. This, he implied, was what the Government were doing by asking the United Nations to impose economic sanctions against that country. He was supported by Derek Walker Smith and Colonel Sir Tufton Beamish. It was doubtful whether the Charter of the United Nations provided for economic sanctions; and if they were voted for, how would they be applied? And was there to be interception of ships approaching the ports of South Africa and Mozambique? If it was proposed to apply sanctions against South Africa and Portugal, would the British Government use its veto in the Security Council to prevent this; or would they risk seriously offending those two countries with which we do much trade? And if South Africa and Portugal continued to supply essential commodities to Rhodesia, the economic sanctions policy could not be effective. Victor Goodhew pointed out that Lord Caradon had said, on a previous occasion at the United Nations, that Rhodesia was a matter for the British Government alone; how then could we rightly appeal for United Nations support in an internal affair?

The question of Rhodesia is a very delicate one, and it requires more tactful handling than it has received during the past two years. It is without precedent; but a parallel may be drawn between it and the revolt of the American colonies in the eighteenth century. The present British Government may be repeating the mistake made by that of George III. The American colonies objected to dictation by a Parliament in which they were not represented; and the Rhodesians have a similar grievance. Granted that sooner or later the franchise in Rhodesia must be extended to include all, or nearly all, the African inhabitants of that country; but who is to say when such a measure would be justified? Certainly not the British electorate, or the British Government—whichever party is in power. Only those who are in full pos-

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session of the facts can determine this issue; and it would appear that the present British Government is influenced more by the uninformed attitude of its supporters than by considerations of the welfare and prosperity of *all* the peoples of Rhodesia.

To say that independence cannot be granted to Rhodesia until the franchise is extended to all black Rhodesians on equal terms with the white is now sheer nonsense. Rhodesia is already independent *de facto* if not *de jure;* and it will remain so, sanctions or no sanctions. Whether Mr. Ian Smith was right or wrong in his unilateral declaration of independence (U.D.I.) is now an academic question only. The fact is established. The only way in which Rhodesia could be brought back into subservience to the British Government would be by a war of subjugation, and that is unthinkable. We know it, and other African states know it too. Therefore, the sooner Rhodesia's independence is recognised and legalised, the sooner will some reasonable compromise on the question at issue be arrived at.

Blame is attachable to both Mr. Smith and Mr. Wilson: to the former perhaps for impatience and to the latter for not appreciating the situation when he came into power. But Mr. Smith is in the stronger position and Mr. Wilson ought to recognise that fact. It would be far better to legalise the existing regime in Rhodesia and make friends with it again than to continue this obstinate attitude and lose its friendship altogether. The question of the franchise will settle itself if left alone and without outside interference. The only alternative to the policy here advocated will involve grievous loss to all the parties concerned; but especially to the black Rhodesians, who are the most vulnerable and will suffer more than any others if economic sanctions are imposed.

Aden

Mr. Sydney Silverman said that there were some seven or eight thousand British subjects now serving in Aden, and that Aden was no longer a British colony but a foreign state though nominally British territory in the Federation of South Arabia. To what courts of law, he asked, were British subjects in Aden answerable and what were their rights of appeal? We ought to ensure, he urged, that they were protected by British courts of law and under British jurisdiction; and not, as it appeared, "hand them over to some vague, ambiguous, undefined court in a foreign country."

Mr. Richard Crossman (Lord President of the Council and Leader of the House) reassured Mr. Silverman. Aden, he said, was still a British colony. Its Supreme Court of Judicature was established under Part 5 of the Aden Constitution; and its powers were those of the High Court of Justice in England. British subjects in Aden had the right of appeal to the highest court in Britain.

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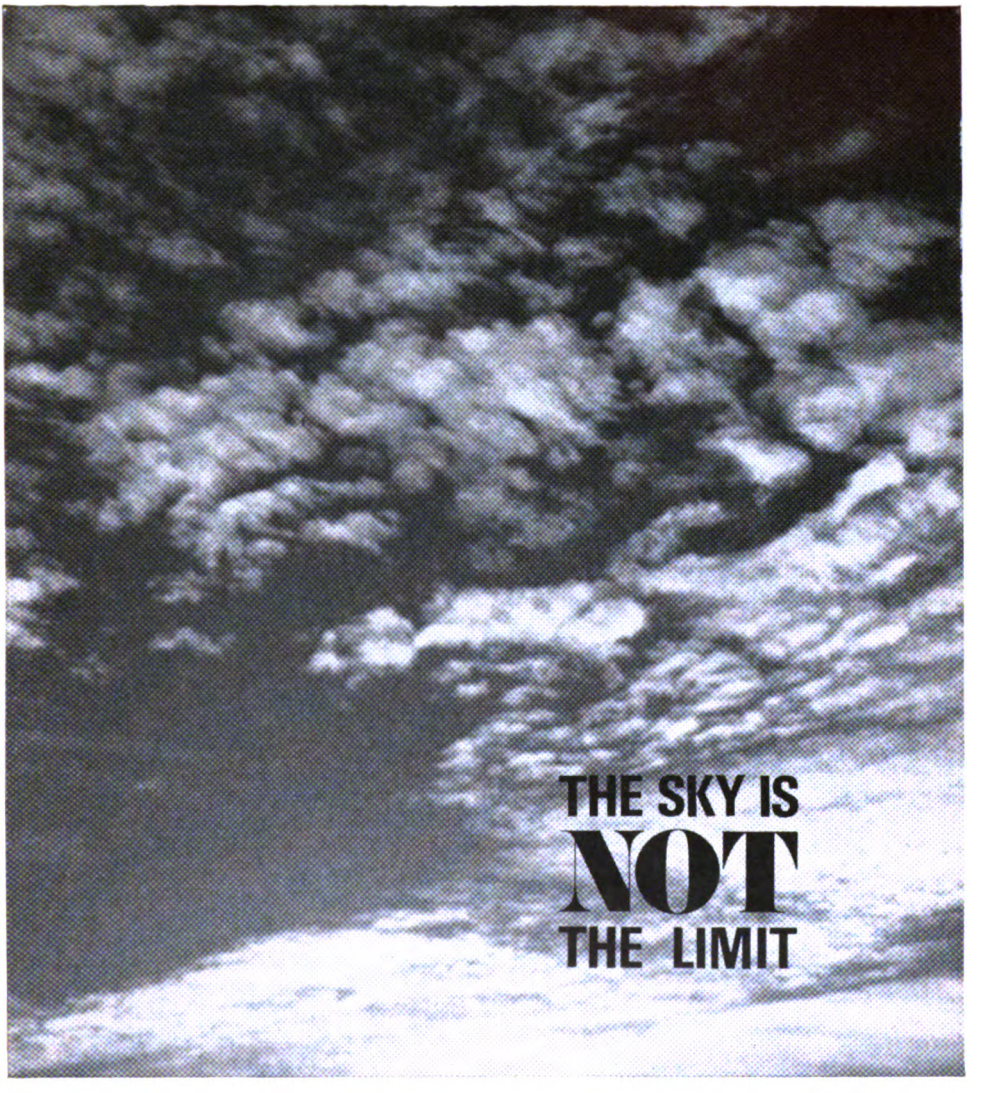

Extending the frontiers of knowledge is the everyday business of the aerospace industry. New design concepts, new manufacturing techniques, new materials must constantly be developed to meet the unceasing demand for increased capability and higher performance. The design and engineering teams of British Aircraft Corporation bring together the knowledge and experience accumulated in over 50 years of continuous technical advance in, first, military and commercial aviation and, more recently, in defence weapon systems and space research equipment. Their skill and ability, backed by massive technical facilities, not only ensure that Britain remains a leader in aerospace but also provides the driving force for technological development over a far wider industrial field.
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CONTRIBUTORS (Career Notes)

Air Marshal Sir Kenneth Porter, K.C.B., C.B.E., C.Eng., F.I.E.E., F.R.Ae.S., R.A.F.

He enlisted in the R.A.F. as an aircraft apprentice in January 1928, and was awarded a cadetship to the R.A.F. College, Cranwell, in December 1930. In 1932 he joined No. 2 (Army Co-operation) Squadron at Manston, Kent, and in 1934 No. 824 (Fleet-Spotter-Reconnaissance) Squadron, flying Fairey IIIFs in H.M.S. "Eagle" in the Far East. He took a specialist signals course in 1936. Between 1940 and 1942 he was Chief Signals Officer No. 11 Group, Fighter Command. In April 1943, he became Chief Signals Officer, 2nd Tactical Air Force, and in 1945 held a similar post at Bomber Command. He was appointed to the directing staff of the R.A.F. Staff College, Bulstrode, in 1947, and in 1950 became Senior Technical Staff Officer, No. 205 Group Middle East Air Force. He commanded Nos. 2 and 1 Air Signallers Schools in 1952 and 1953, and again became Chief Signals Officer of 2nd T.A.F. in 1954. The next year he became Chief Electronics Officer at Fighter Command. He took the Imperial Defence College course in 1959 and then became Commanding Officer, R.A.F. St. Athan, Glamorgan, and Air Officer, Wales. In October 1961, he was appointed Director-General of Ground Training, and in April 1964 Director of Signals at the Ministry of Defence (Air). In July, 1966, Her Majesty approved his appointment as Air Officer Commanding-in-Chief Royal Air Force Maintenance Command.

Major General Clyde Box became Commander of Third Air Force on 27 October, 1966.

With the withdrawal of the 19th Bomb Group from the Philippines early in World War II, he accompanied the remnant of the unit to Australia, Java, and finally New Delhi, India, where he assisted in organizing the Tenth Air Force. While in India (1942-43) he participated in the early surveys for initiation of "The Hump" operations and, as Commander of the 436th Bomb Squadron, took part in 13 raids against the Japanese. He returned to the United States in late 1943 and served in the Asiatic Theatre section of the War Department General Staff through the remainder of the war.

General Box's post-war experience included tours at the Command and General Staff School, Fort Leavenworth, Kansas (1945-46); key positions in the office of the Deputy Chief of Staff (DCS)/Personnel, HQ USAF (1946-48); and as a student at the Air War College (1948-49). Between July 1949 and August 1952 he served as DCS/Plans and Operations, Special Weapons Command, Kirtland Air Base, New Mexico. After attending the National War College (1952-53), he became the Deputy Executive Assistant to the Secretary of the Air Force (1953-55). In August 1955 he assumed command of the 60th Troop Carrier Wing at Rhein Main Air Base, Germany and in March 1956 became the Commander of USAFE'S 322nd Air Division at Evreux-Fauville Air Base, France. In July 1959 General Box returned to the United States as Commander of the 464th Troop Carrier Wing at Pope Air Base, North Carolina and in October 1961 became Director of Plans, HQ U.S. Strike Command. From July 1964 until his assignment to Third Air Force, he commanded the Six Allied Tactical Air Force, a NATO unit with headquarters at Izmir, Turkey. General Box is a command pilot and qualified paratrooper.

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R.A.F. BENEVOLENT FUND

DURING 1966 the expenditure by the Royal Air Force Benevolent Fund on relief of distress among serving and ex-Service members of the Royal Air Force, their families and dependants, totalled over £905,000, the highest level of expenditure since the Fund was set up in 1919.

Air Marshal Sir John Whitley, the Controller of the Fund, when releasing these figures to the Press commented that increased support by the public was essential if assistance at this level was to continue.

Clearly this expenditure—equal to the turn-over of a considerable commercial enterprise—calls for support of a very high order. It is, therefore, particularly gratifying that over 90 per cent of all R.A.F. serving personnel voluntarily give half-a-day's pay every year to support the Service's own charity. These voluntary subscriptions were inaugurated in April, 1938, since when the Fund has received nearly £2,000,000 from this source.

But this Service support, even at such a splendid level, now amounts annually to only 13½ per cent of the total expenditure on relief.

At the annual Council Meeting in May last year, Princess Marina, Duchess of Kent, President of the R.A.F. Benevolent Fund since 1942, said: "I am so delighted to hear that the contributions made by the Service were greater in 1965 than in any year since 1944, when the strength of the Royal Air Force was so much larger than it is nowadays."

Analysis of the figures for expenditure shows that, for some years now, help with house purchase, mainly for widows, has been the Fund's largest single item of relief. Present indications are that it will go on increasing for a few more years yet.

The Fund itself, naturally, makes every effort to raise money by the organisation of such events as the annual Royal Air Force Anniversary Concert at the Royal Festival Hall. The total raised by these concerts since their inauguration in 1956 at present stands at about £11,000. And the concerts, twice graced by The Queen and by others of the Royal Family, do much to draw public attention to the Fund.

In frequent visits to R.A.F. Stations up and down the country and in talks to the many honorary county representatives, helpers and education advisers of the Fund in local areas, Air Marshal Sir John Whitley is wont to emphasise that the Fund has disbursed nearly £14,000,000 since it was established in 1919 and over £13,000,000 of that amount since the second World War. The inescapable fact is that the pace is increasing— the Fund must make every effort to increase annual income. It is there that both members of the general public and those now serving in the Royal Air Force can by increased efforts help the Fund to meet its obligations.

It is a sobering thought that on the day you read this article, as on every day in 1967, the Royal Air Force Benevolent Fund will have expended on relief over £2,550 and will continue to do so every day of the week throughout every week of the year. And next year it will probably be more.

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The Officers' Pensions Society

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GENERAL THE LORD BOURNE, G.C.B., K.B.E., D.S.O.

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GROUP OFFICER L. H. TURNER, C.B.E.
AIR MARSHAL SIR COLIN WEEDON, K.B.E., C.B.

The Society's activities influenced the grant of: **Increases** in Officers' Widows' Pensions from December, 1952, and in the retired pay of some 8,250 officers from April 1st, 1954; the **1956, 1959, 1962 and 1965 Increases for all retired Officers** over 60 and for **widows.**

The Society was founded in 1946, and its **objects are** to procure the improvement and increase of pensions, retired pay, and other benefits of officers and widows of **the three Armed Services;** and to promote in every way their interest and welfare.

It is the only body comprising officer members from all three Services whose policy is controlled solely by its members. It is complementary to, and works in co-operation with, the Royal Air Forces Association, the Association of Retired Naval Officers, the Officers' Association or other Service Associations.

Membership is open to retired officers, to dependants of serving or retired officers, and to widows and dependants of deceased officers of the Armed Forces. **Membership now exceeds 30,000,** which number is increasing every day.

The annual subscription is £1 for all, except widows and dependants of deceased officers, for whom it is 5s.

Full particulars and forms of application can be obtained from:

The General Secretary, The Officers' Pensions Society, Ltd.
137 Victoria St., London, S.W.1 Tel: VICtoria 0853

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AIR OFFICER APPOINTMENTS

DEFENCE STAFF

AIR CHIEF MARSHAL SIR CHARLES ELWORTHY, G.C.B., C.B.E., D.S.O., M.V.O., D.F.C., A.F.C., M.A., as Chief of the Defence Staff. April, 1967.

MINISTRY OF DEFENCE (AIR)

AIR CHIEF MARSHAL SIR JOHN GRANDY, G.C.B., K.B.E., D.S.O., as Chief of the Air Staff, Royal Air Force. April, 1967.

AIR MARSHAL SIR PETER WYKEHAM, K.C.B., D.S.O., O.B.E., D.F.C., A.F.C., A.F.R.AE.S., as Deputy Chief of the Air Staff. 30th January, 1967.

AIR MARSHAL SIR REGINALD EMSON, K.C.B., C.B.E., A.F.C., as Inspector General, Royal Air Force. February, 1967.

BOMBER COMMAND

AIR COMMODORE J. T. LAWRENCE, C.B.E., A.F.C., as Senior Air Staff Officer No. 3 Group, November, 1966.

TRANSPORT COMMAND

AIR MARSHAL SIR THOMAS PRICKETT, K.C.B., D.S.O., D.F.C., as Air Officer Commanding-in-Chief, Transport Command. January, 1967.

AIR VICE-MARSHAL R. C. AYLING, C.B., C.B.E., as Air Officer in charge of Administration, Transport Command. November, 1966.

MAINTENANCE COMMAND

AIR VICE-MARSHAL W. J. MAGGS, C.B., O.B.E., M.A., as Senior Air Staff Officer, Maintenance Command. 7th March, 1967.

AIR COMMODORE J. C. WICKHAM, O.B.E., as Air Commodore Supply, Headquarters Maintenance Command. 30th January, 1967.

NEAR EAST AIR FORCE

AIR MARSHAL E. G. JONES, C.B., C.B.E., D.S.O., D.F.C., as Air Officer Commanding-in-Chief, Near East Air Force; Commander British Forces Cyprus, and Administrator of the Sovereign Base Areas. November, 1966.

AIR VICE-MARSHAL R. D. ELLIOTT, C.B., O.B.E., D.F.C., as Air Officer Commanding Malta, and Deputy Allied Commander-in-Chief (Air), Allied Forces, Mediterranean. November, 1966.

RETIREMENT

AIR VICE-MARSHAL W. MACI. KING, C.B., C.B.E.

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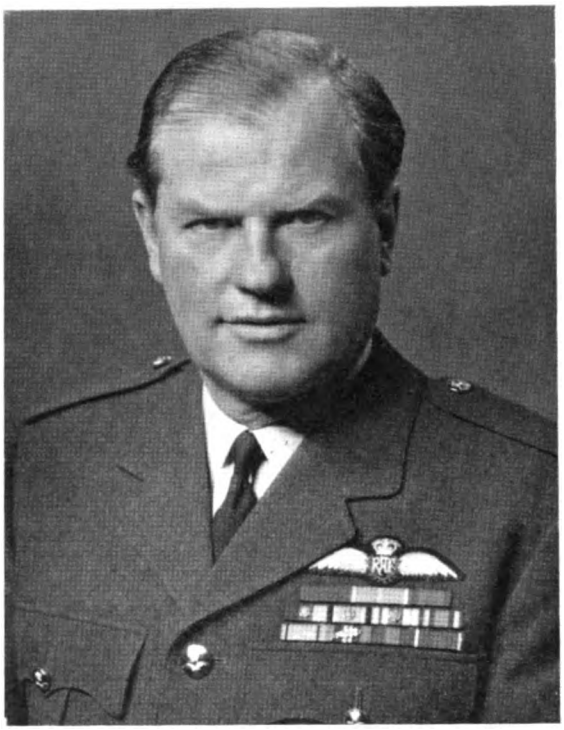

A NEW CHIEF OF THE AIR STAFF TAKES OVER

HER Majesty the Queen has been pleased to appoint Air Chief Marshal Sir John Grandy, G.C.B., K.B.E., D.S.O., as Chief of the Air Staff with effect from 1st April, 1967.

Air Chief Marshal Sir John Grandy (53) has been Commander-in-Chief, Far East, since May, 1965. Before that he was for a year Air Officer Comanding-in-Chief, R.A.F. Bomber Command, for two-and-a-half years C.-in C. R.A.F. Germany, and Commander, 2nd Allied Tactical Air Force.

Born at Northwood, Middlesex, and educated at University College School, London, he joined the R.A.F. in 1931, and during the Battle of Britain commanded No. 249 Squadron (Hurricanes) based at North Weald. In 1941-44 he held other posts in Fighter Command and in the Middle East, and in February, 1945, took command of No. 341 Wing (Dakotas) in S.E. Asia, being awarded the D.S.O. for hazardous operations over Burma. He led the first force of supply aircraft to land at Rangoon after the Japanese retreat.

Since the war he has held various posts in Fighter Command — as commander of a fighter sector, Commandant of the Central Fighter Establishment and as Air Commodore Operations at Command Headquarters — and been Air Attache in Brussels. He took the 1957 Imperial Defence College course, then commanded Task Force "Grapple" (which conducted the British nuclear tests from Christmas Island in the Pacific) and was Assistant Chief of the Air Staff (Operations) in 1958-60.

There will be many additional burdens ahead to those which normally confront a new Chief of the Air Staff. The uncertainty of the fruition of many projects allegedly in the pipe-line such as the Anglo-French advanced swing wing strike fighter; the F.111A's suitability to replace the murdered TSR.2 and number of these and Phantoms likely to materialize, the availability of spares for them under all circumstances; and the dubious deal over Anglo-French helicopters. Sir John Grandy's future task will not be an enviable one, but we have every confidence that the future of the R.A.F. is in most competent hands; we wish him every success in his new appointment.

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A NEW CHIEF OF THE DEFENCE STAFF TAKES OVER

Air Chief Marshal Sir Charles Elworthy, G.C.B., C.B.E., D.S.O., M.V.O., D.F.C., A.F.C., M.A.

After handing over his appointment as Chief of the Air Staff to Air Chief Marshal Sir John Grandy on 1st April, 1967, is to succeed General Sir Richard Hull as Chief of the Defence Staff.

Air Chief Marshal Sir Charles Elworthy became Chief of the Air Staff on September 1, 1963. He was born on March 23, 1911, at Timaru, New Zealand, educated at Marlborough College (1924 - 29) and Trinity College, Cambridge, from which he graduated in 1933 with an honours degree in law. He was called to the Bar (Lincoln's Inn) in 1935.

He joined the Reserve of Air Force Officers and learned to fly at Brough, Yorks., in 1933, was posted to No. 600 (City of London) Squadron, Auxiliary Air Force, in 1935, and was granted a permanent R.A.F. commission in 1936, as a University Entrant. Following duty with No. 15 (Bomber) Squadron, flying Harts, in 1939 he continued to fly with No. 108 Squadron of Blenheims, and after a brief spell as a chief flying instructor at a bomber operational training unit joined No. 82 Squadron, also flying Blenheims. He became its C.O. in 1940. He won the A.F.C., D.F.C., and D.S.O., between January and April, 1941, as a result of a series of operations against enemy shipping and ground targets.

In 1943 - 44 he commanded R.A.F. Waddington, Lincs., then operating Lancasters, and in August, 1944, became Senior Air Staff Officer at No. 5 (Bomber) Group. In 1946 he was Group Captain (Plans) at the R.A.F. Central Bomber Establishment, and was in charge of that unit's first overseas liaison flight by the Lincoln "Excalibur"—a five-week tour of the Far East, Australia and New Zealand. In 1947, while on loan to the Royal Pakistan Air Force, he commanded its station at Drigh Road, Karachi. In 1949 he took the course at the Joint Services Staff College, then became Director of Personnel at Air Ministry.

In 1951 and 1953 Air Chief Marshal Elworthy successively commanded R.A.F. Tangmere, Sussex, and Odiham, Hants, and was created an M.V.O. in 1953 for his work in organising the Coronation Review of the Royal Air Force at Odiham. In December, 1953, he took command of the Metropolitan Sector, Fighter Command, and in 1954 attended the special study period at the School of Land/Air Warfare. Two years later he took the Imperial Defence College course. He was Deputy Chief of the Air Staff from November, 1959, until appointed Commander-in-Chief, Middle East Command at Aden in August, 1960.

In 1966, on his 55th birthday, Sir Charles piloted a "Lightning" fighter to qualify for his "ten-ton up tie," worn by R.A.F. pilots who have flown faster than 1,000 m.p.h.

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Book Reviews

The Murder of TSR-2 by Stephen Hastings, M.C., M.P. (Macdonald London, 206 pp., 20 illustrations; 35/- net).

This is a book of great interest to anyone even remotely connected with aviation or interested in Government leadership in industry. Stephen Hastings is a Director of Handley Page and knows his subject although his Company was not involved in the TSR-2. He is a Conservative M.P. but he is objectively critical of both Conservative and Labour Governments for their handling of the TSR-2 and for the disastrous loss of the technological leadership the development of this project had put within our grasp.

There is a concise account of the conception and building of the TSR-2 and interesting details of the test flying which in themselves make the book worth while. The costs of the project are analysed and the conclusion drawn that economies are always possible by sacrificing some part of Government policy and the Service requirements to fulfill it, but the author claims that neither efficiency nor economy follow from purchasing the more complicated weapon systems from America.

Strong criticism is directed against Government indecision and delay in the early stages. The present Government is accused of having ridden to power with the slogan that they would get technology going — yet in 6 months they smashed up the country's sharpest technological spearhead.

"Expert" advice to the Government is strongly attacked and some familiar figures have their opinions taken apart. One reads many things that have been said repeatedly in clubs, bars and messes where aviation personnel foregather — and the author offers chapter and verse in support of his views.

The whole TSR-2 story makes sorry reading but the book does not stop short at criticisms of the past — it offers suggestions for the more efficient handling of great national technological projects in future. Two of the specific proposals are the formation of standing, all-party committees in Parliament and the formation of an aero-space Board, including members from industry and the Services and coming directly under the Cabinet. These and other suggestions are thought provoking and well worthy of debate— possibly in the columns of the R.A.F. Quarterly? W.L.D.

The World Guide to Combat Planes, by William Green (Macdonald & Co., Ltd.; two volumes, 222 and 212 pp. respectively; fully illustrated; each 25s.)

In two small, pocket-size books, Mr. Green gives the most comprehensive guide to current first-line air power that has ever been published. Volume One is devoted to interceptor and strike fighters and attack aircraft, each type being covered by brief notes on its development and variants, a tablet of basic data, one or more photographs and a "3½-view" tone-drawing. But this is by no means the lot. Pages 7-44 give brief notes on the world's air forces, with particular reference to their combat equipment. Pages 45-61 trace the post-war development of fighter aircraft and are illustrated with drawings and photographs of types under development or intended only for research. Finally, after the "ironmongery" sections, comes a 12-page review of combat aircraft avionics which gives a clear picture of why the autopilot, radio, radar, fire control and navigation systems of a modern fighter account for up to 30 per cent of its total cost.

Volume Two, dealing with bombers, tactical reconnaissance aircraft, patrol and anti-submarine aircraft, counter-insurgency aircraft and combat helicopters, is in many respects even more interesting. Few people appreciate fully the extent to which the once-humanitarian helicopter has now become a formidable weapon of tactical warfare, or how intense is the electronic and photograph reconnaissance activity carried out daily by the U.S. and Soviet air forces. Mr. Green would hardly claim to give a complete picture in so small a scope; but these two books, completed by sections on airborne armament and power plants in Volume Two, are among the most worthwhile of the many fine and highly-accurate reference works that have come from his pen. J.W.R.T.

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Bombers and **Fighters,** by Kenneth Munson (Blandford Press Ltd., London; each 147 pp.; fully illustrated; each 16s.)

In these days of high printing costs, it requires considerable courage, and confidence in sales potential, to set out to produce a long series of aircraft books, each containing 80 full-page full-colour illustrations, at a retail price of only 16s. each. Blandford Press have done just this with their new series of books that will eventually make up a complete Pocket Encyclopaedia of World Aircraft in Colour. Author of the books is Kenneth Munson and the team of six artists is headed by John Wood. These two bring considerable experience of aircraft writing and illustration to the task and it is unlikely that the shortcomings in the first two volumes can be laid at their door.

The printers are probably to blame for the somewhat startling colour schemes of one or two aircraft and the poor register of others. Occasional inaccuracy of aircraft outline (compare the rudders of the two Canberra variants on pages 22 and 23 of Bombers) probably reflects the impossibility of obtaining precisely the same standards of accuracy and style from so many artists.

Setting aside such criticisms, which will almost certainly be noted in the preparation of later books in the series, it would be unjust not to congratulate the author and publisher on their enterprise. Everyone grows tired of seeing the same old photographs, of the rarer types of military aircraft in particular, in dull and often grainy black-and-white. This time, great care has been taken to show the aircraft in as many different national insignia as possible. There are a Brazilian B-25J Mitchell, a Pakistani B-57C, an East German Il-28, a South African Buccaneer, an Indonesian Tu-16 and an Israeli Vautour among the first 17 aircraft in the **Bombers** book, whereas one normally sees these types in the less interesting markings of the nations that built them. Even Albania, Dominica, Guatemala and the Republic of Korea are represented by aircraft in their national insignia, which must have demanded some careful and patient research.

In addition to a useful coverage of current fighter aircraft, the first book includes training and attack types. Similarly, the **Bombers** book includes patrol and transport aircraft, and both volumes contain notes on missile armament.

J.W.R.T.

The Courage of the Early Morning, by W. Arthur Bishop (William Heinemann Ltd., London; 206 pp.; illustrated; 30s.)

By one of those coincidences that seem inevitable in the publishing world, three books about pilots who were awarded the Victoria Cross in the 1914-18 War have appeared almost simultaneously. This one is the biography of the Canadian "ace of aces" Billy Bishop, written by his son, who is also an ex-fighter pilot and a professional writer.

There could be no better subject for such a book, for Bishop conformed precisely with the popular image of a fighter pilot. "A younger son of respectable parents, who were dismayed by his inability to make the grade at anything much except squirrel shooting, he scraped into the Canadian Royal Military College. After an unpromising period at flying school, he joined the R.F.C. in France. He wasn't a good pilot — the unorthodox Bishop take-off and landing were notorious. But he was a deadly marksman." This is no over-statement concerning a pilot who was eventually credited with 72 victories in aerial combat and was decorated with the V.C., D.S.O. and bar, M.C. and D.F.C.

He achieved his successes in only eight months of combat flying, between March 1917 and June 1918. On the ground, he enjoyed life to the full, hating all forms of discipline and loving riotous parties. His achievements made him one of the most fêted heroes of his day — a man who rubbed shoulders with the rich and influential classes, who could share a joke with the King and make fitting company for men like Churchill and Beaverbrook.

The twenties and thirties did nothing to lessen his love of life or his social and business successes. He helped to found the R.C.A.F., organised recruiting and flying training in World War II and died peacefully in his sleep in 1956, a full Air Marshal.

J.W.R.T.

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Jane's All The World's Aircraft — 1966 - 1967. Edited and compiled by John W. R. Taylor, F.R.Hist.S., A.R.Ae.S. (Samson Low, Marston & Co., London: 577 pp.; with comprehensive Index 25 pp.; 1,112 illustrations and 462 line drawings: £8 8s. 0d. net).

In the "FOREWORD" the Editor reviews with pleasing clarity the wide field of World Aviation in 1966, its planned development for the 1970's and portent for the future.

His views and conclusions are worthy of our most careful consideration — they are those of an acknowledged expert in aeronautical affairs, who has published many books and broadcast over the B.B.C. on special aspects of aircraft development. An immediate need for the future, he suggests is to plan an international rescue service for astronauts stranded in space, preferably by America and the USSR ". . . a worthy joint project with which to begin breaking down the barriers of nationalism and suspicion."

The information on salient points in world aeronautics is most interesting and enlivened by some plain speaking on controversial matters such as the cancellation of TSR-2 and other military programmes, which almost wrecked the British aircraft industry; the probability that the RAF's F111A's will not fulfil earlier expectations, be incapable of doing the same jobs as the late-lamented TSR-2 and in the end be just as costly. By the cancellation of these world beating military projects . . . "Britain is missing a whole generation of military aircraft" . . . "unless major new designs are on the drawing board in a matter of weeks, rather than months, or even years, there will be nothing to sell in the 1970's."

"International Programmes" has been added as a new Section; the Aircraft Section has been extended from 346 to 367 pages and there are extra pages in the Missile Section. The considerable increase in technical details of Russia's most advanced designs in aircraft and engines has already been hailed in earlier reviews as a great scoop by the Editor, who in his FOREWORD acknowledges the generous assistance from official Soviet sources and from the Editorial Director of "Aviation Magazine International," who recently toured sections of the Soviet commercial aircraft industry.

This new edition enhances the already established reputation of "JANE'S" as the most authoritative reference book on "All The WORLD'S AIRCRAFT," unequalled for its comprehensiveness and quality of production. A.H.S.

Mannock V.C. (Neville Spearman Ltd., London; 221 pp.; illustrated; 30s.)

This is a remarkable book about a remarkable man. Major "Mick" Mannock is remembered as the officer who succeeded Billy Bishop as commander of the famous 85 Squadron in France and went on to exceed the achievements of his predecessor. He is credited officially with 73 victoris, but the true figure was probably over 100. The discrepancy resulted from his habit of lining up kills for younger and less experienced pilots, in order to give them confidence during their critical first few sorties.

Few great leaders had to overcome such formidable obstacles on the road to immortality. Born in 1889 to Irish parents, he was taken to India when his father, an N.C.O. in the Second Inniskilling Dragoons, was posted for garrison duty. Mick early suffered a mysterious ailment which caused near-blindness in his left eye. This was one of the reasons why his personality turned inwards. Nor were matters helped by the fact that his father was dissolute and ambivalently possessed of affection and hatred for his family and the trammels of responsibility.

Little wonder that Mannock was so different from other pilots — a fact that is emphasised again and again in this book. His leadership and encouragement of youngsters sent to his squadron could change quickly to threats to shoot them down himself if he thought they displayed cowardice; and he had an uncompromising hatred for the enemy, despising those who, for example, felt regret at the death of von Richthofen. In contrast, he held to chivalrous and idealistic notions when it came to women.

What makes this book so interesting, valuable and unique is that it consists mainly of a wholly authentic facsimile text reproduced from Mannock's own personal diary, which he kept during his months in France. Opposite each page of manuscript is a type-set version and the author has added detailed explanatory notes. Seldom has any book given a more vivid insight into the type of men who fought the first war in the air, and what it cost them.

J.W.R.T.

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Hawker V.C., by Tyrrel M. Hawker (The Mitre Press, London; 253 pp.; illustrated; 35s.)

This biography of Major Lanoe Hawker, V.C., D.S.O., was written by his younger brother; almost inevitably, the picture that emerges is of a whiter-than-white knight in shining armour. However, this should not be allowed to deter anyone from reading the story of a fighter pilot who made a tremendously important contribution to Allied victory in the air in 1914-18. In terms of combat successes, Hawker, with nine confirmed kills, did not come in the first 180 British "aces"; but his achievement paved the way for many of those who came after him.

Hawker's background was very different from that of Mannock. He came from a family that had held commissions in the army, without break, since the days of the first Queen Elizabeth. When he went to Britannia Naval College in 1905, he was nominated by Prince Louis of Battenberg; and when he decided later that he wanted to fly, he could quite easily afford the private flying lessons that were an essential preliminary to acceptance for the R.F.C. and Central Flying School. Not that this implies any lack of personal spirit; anyone who took his first lessons on the rather frightening tail-first Valkyrie monoplane could hardly have lacked courage or a real will to fly!

Posted to No. 6 Squadron, he flew across the Channel with the other eleven pilots of this unit on 7th October, 1914, at the controls of a Henri Farman biplane. For a period, Hawker was engaged in reconnaissance work, on this type and the B.E.2C. The turning point in his career came in June 1915, when he became one of the first pilots to be allocated a Bristol Scout, armed with a machine-gun, for the express purpose of fighting and "keeping the German aviators in a thoroughly well-hunted condition." He did this so efficiently that he became the first British pilot to be awarded the Victoria Cross for success in air combat.

Almost simultaneously, the opposition received a powerful "shot in the arm" in the form of the Fokker monoplane — first real tractor fighter with a synchronised forward-firing machine-gun. Throughout the Autumn and Winter of 1915-16, the Fokker scourge continued, until the Allied air forces, and particularly the R.F.C.'s B.E.2C. reconnaissance squadrons, were almost shot from the skies. Angry Members of Parliament asserted that British pilots were being murdered by the incompetence of those who should have given them aircraft capable of meeting the Fokker on equal terms. So bad did the situation become that a B.E.2C. assigned to a reconnaissance mission in February 1916 was allocated an escort of twelve other aeroplanes.

By then, however, the Fokker was nearing the end of its supremacy. Two pusher types designed by Geoffrey de Havilland — the F.E.2b and D.H.2 — entered the lists and quickly established a mastery of the air that saved the day. Commander of the first D.H.2 Squadron (No. 24) was Lanoe Hawker, and it quickly became one of the happiest and most successful units on the Western Front. Hawker himself fell before the guns of von Richthofen on 23rd November 1916; but he had done his job well and the German air force never again dominated the air so completely as it did in the heyday of the Fokker monoplane. **J.W.R.T.**

A History of 208 Squadron. By Flight Lieutenant D. S. B. Marr. (115 pp.; 30 illustrations).

No. 208 Squadron formed on 26th October, 1916, at St. Pol, Dunkirk, being then designated No. 8 Naval Squadron, RNAS, until the amalgamation of the RNAS and RFC on 1st April, 1918, when it was renumbered No. 208 Squadron, RAF.

Its first Commanding Officer was Squadron Leader Geoffrey Bromet — now Air Vice-Marshal Sir Geoffrey Bromet, KBE., CB, DSO, DL, RAF (Ret), who has contributed the "Foreword" to this excellent history of one of the most well-known Squadrons of the Royal Air Force.

Of its 50 years of existence no less than 40 years were spent in the Middle East, which must constitute a record.

Packed with momentous and colourful events, with 30 most interesting photographs from 1916 to 1966, supported by Appendices containing very complete lists of — Commanding Officers — Honours and Awards — Aircraft — Locations and even a list of the Mess Silver, the author has done a wonderful job of work. Past members of 208 Squadron who wish information on their "Old Comrades Association" should write to the Secretary: R. W. Booker, Esq., 18 Blacksmith's Crescent, Sompting, Sussex. **A.H.S.**

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Opportunity Knocked, by Hughie Green (Frederick Muller, Ltd., London; 224 pp.; illustrated; 21s.)

To most readers of the Royal Air Forces Quarterly, Hughie Green will be best-known as the television star of shows like Opportunity Knocks and Double Your Money. Some may remember his brush with the Soviet Air Force in the spring of 1963, when he was subjected to the full treatment of "buzzing" and warning shots across the bows by Russian fighter pilots whilst flying a private aircraft down the air corridor to West Berlin. Few will know of his earlier contacts with Soviet airmen during the war; yet the story of these makes one of the most interesting and amusing chapters of this autobiography.

As a member of 45 Group, R.A.F. Ferry Command, Green had the job of ferring flying-boats across the Atlantic, V.I.P.'s to Washington and a variety of aircraft to South America, India, Africa, Australia, and anywhere else they might be needed. So, when President Roosevelt decided in the summer of 1944 to sell Stalin 90 Catalinas at a nominal three dollars apiece, he was one of the four highly-experienced pilots assigned to the task of helping the Russians fly the aircraft from North Carolina across the Atlantic.

"The Russian crews, on average, comprised six of the largest non-English-speaking guys you've ever seen. None of us, of course, could speak Russian, and the pantomimes that ensued when we were airborne could fill a volume . . . Take it from me, when you are 12,000 feet up, hundreds of miles from land, and you want to get across to a grinning Russian engineer that if he doesn't pull a certain lever the engines are going to stop, your ability to read conversational titbits like: 'Is your mother well?' or 'Can you direct me to the bus station?' will get you nowhere."

Green says that he grew to like the Russians a lot, "but as aircrew they were way, way below R.A.F. standards and had a disconcerting way of making up for their lack of skill or horse-sense with an abundance of zany courage." The final straw came one day when he allowed a Russian co-pilot to land one of the Catalinas in Newfoundland. "He followed his senior officer, in the flying-boat in front of us, into the roughest bit of water in the bay at Argentia. We hit a wave and the giant plane bounced right over the top of the one in front."

Such stories make this a very readable book which adds a little colour to more prosaic knowledge of R.A.F. activities in wartime. It also shows that there is much more to Hughie Green than just a popular TV personality. J.W.R.T.

Airway to the Isles, by Philip Cleife (Hodder and Stoughton Ltd., London; 224 pp.; illustrated; 30s.)

It takes a brave man to sit down and write the story of a dream that came true only to end in failure and misery; such a man is Philip Cleife, founder in 1961 of a tiny independent airline named Mayflower Air Services. After ten years in the R.A.F., including a long period at the Empire Flying School, Hullavington, he felt well qualified to fly passengers between Plymouth and the Isles of Scilly in a Rapide biplane, but could hardly have anticipated the jungle of red tape that he would have to carve his way through before he could open his air service in July 1961.

After that things seemed to go reasonably well. There were problems, but passengers included a future Prime Minister, Harold Wilson, and business improved to the stage where Mrs. Cleife was able to give up her part-time job and become Mayflower's traffic manager at the princely salary of £3 per week. Her uniform was a home-made conversion of a grey costume she had bought from Hardy Amies for normal social wear.

A first-year loss of £2,210 was turned into a profit of £272 in the second year. This was all that Philip Cleife earned for his efforts as General Manager and Chief Pilot, and for carrying 1,678 passengers on the Scillies service alone between 1st March and 14th October 1962, with a regularity of 96 per cent., despite a difficult season for weather. But the important fact was that he had survived, and he had big plans for 1963.

As a start, he bought a second Rapide. Then Pete Loat joined him and Mayflower had two experienced Captains. Simultaneously, he received permission to operate scheduled services into St. Mawgan, only a few miles from the large and prosperous Cornish holiday

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resort of Newquay. He began to make great plans for future expansion, with two more Rapides and a Heron as possible additions to the fleet in 1964, field evaluation of STOL types like the Pioneer, perhaps even helicopters — like B.E.A. — one day.

But for Philip Cleife the dream ended on 20th July 1963. A tyre-burst during take-off at St. Mary's Airport, Scilly, led to a crash from which he emerged with serious, almost fatal, burns. Throughout his months in hospital, his wife kept the airline going; but eventually he sold out to new owners. The final words of his story are, "Was it worth it?" Different readers may suggest different answers.

J.W.R.T.

European Transport Aircraft Since 1910, by John Stroud (Putnam & Co., Ltd., London; 680 pp.; fully illustrated; 105s.)

Only a small proportion of all the aviation books that are published annually justify a permanent place on the shelf reserved for those that are put to almost daily use. In recent years, Putnam have provided more than their share of such works, and this monumental volume by John Stroud makes one more.

With a personal association with air transport which goes back to the mid-thirties, John Stroud is the acknowledged expert on his subject. The knowledge, care and sheer man-hours that have gone into this book guarantee its accuracy; but it is no mere catalogue of ironmongery. The ten-page Introduction traces the history of European transport aircraft from the time when the first services were operated with post-World War I bombers, and contains much that is new and of interest.

It may surprise many readers to discover that the first European nation to begin regular airline services, early in 1919, was the newly-defeated Germany, with aircraft that still bore the wartime black cross insignia. Even the most economy-class seating of today is clearly luxurious by comparison with the wicker chairs inside the bare cabin of the Farman Goliath illustrated on page 17; but the author recalls that no aircraft of today can match the spacious comfort offered in the 'thirties by Germany's transocean Zeppelins.

The details of some 300 basic types of aircraft, which fill 558 of the book's 680 pages, follow the familiar Putnam formula, except that there are no three-view drawings this time. This may be as well, because their inclusion would have forced the price of the book even higher. Five guineas is still a lot of money; but **European Transport Aircraft Since 1910** is a lot of book, with many illustrations that have never before been published. Nobody who buys it is ever likely to regret doing so.

Common Market enthusiasts may be startled at the non-inclusion of British aircraft, but these are already covered fully in the two **British Civil Aircraft** volumes by A. J. Jackson, which were published some years ago by Putnam and are in every aviation library worthy of the name. It would have been unnecessary — and again costly — duplication had they been included in this new book. What is included is a list of individual registrations of — so far as possible — every European transport aircraft ever used for regular airline service. This alone makes the book indispensible.

J.W.R.T.

The Royal Australian Air Force. By George Odgers (Literary Services and Production; London; 192 pp.; 260 illustrations and 9 maps; 50/- net).

A fully illustrated history of the RAAF, which begins with early aviation in Australia in 1909-10, the birth of military flying at Point Cook in 1914, the formation and operations of the Australian Flying Corps in the First World War, after which in 1922 the RAAF was formed and the author highlights 50 years of Australian Military Aviation.

The thoroughness of his research is obvious from the completeness of his story, which is supported by relevant pictures following the sequence of events. Maps showing the theatre of air operations are most helpful.

The British RAF co-operated so closely with the RAAF in so many spheres of operations in both the First and Second World War, that many past and present members of the RAF would find this book of the greatest interest.

A.H.S.

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US. Civil Aircraft, Volume 3, by Joseph P. Juptner (Aero Publishers, U.S.A., obtainable in the U.K. from W. E. Hersant Ltd., 228 Archway Road, London, N.6; 292 pp.; fully illustrated; 71s.)

This is the third instalment of Joseph Juptner's chronological record of all the aircraft which have received an "Approved Type Certificate" from the U.S. government. As in Volumes One and Two, one hundred aircraft are described and illustrated. All are machines from the 1930 era, including such well-known designs as the Curtiss Robin, Ford Tri-motor and Travel Air; but many of the 316 photographs are published for the first time and it is doubtful if even the most knowledgeable British reader will have heard of some of the types that were virtually stillborn in this period of the Great Depression.

Among the victims was the Keystone Patrician, largest three-engined transport of its day, with a standard of accommodation that made it the ultimate in contemporary passenger aircraft. Even when Keystone lowered the price of production models to a paltry $65,000 in an effort to attract some orders, none came.

Certificate No. 231 went to a low-wing monoplane known as the Nicholas-Beazley NB-3G, of interest to British readers as it had an Armstrong Siddeley Genet engine of 80 h.p., with which it set up a lightplane altitude record of over 25,000 ft. A fair number were built, but are no better remembered today than the Golden Eagle Chief (No. 202), Kreutzer Air Coach (No. 223), Mercury Chic (No. 235), Mohawk Pinto (No. 263) or Bach Air Yacht (No. 271).

Glancing through the illustrations, one wonders why the Rearwin Ken Royce 2000-C should look so familiar when only three were built, so long ago. The answer is given in the very latest **Jane's All the World's Aircraft,** for the present-day Robinson Mere Merit amateur-built light aircraft is a scaled-down replica of the Ken Royce, complete even to the original paint-scheme.

Last type described in this book is the Lockheed Sirius Model 8, developed originally for Charles Lindbergh, whose famous Atlantic flight had taken place only three years earlier. It marked a significant milestone — not only because its clean low-wing monoplane design pointed the way to the future, but because, by producing aircraft of this calibre, companies like Lockheed, Boeing, Cessna and Curtiss became sufficiently well established to survive the depression that closed many of their competitors.

J.W.R.T.

Nuclear War and Nuclear Peace. Y. Harkabi (Oldbourne Press, London; 303 pp.; 54/- net).

This book by Brigadier General Harkabi, now in charge of Strategic Research in the Israel Ministry of Defence, was published in Hebrew in 1964; the English translation was completed in November, 1966.

It deals with the grave issues which now arise from nuclear weapons and the wider aspects of the impact of them on world affairs today.

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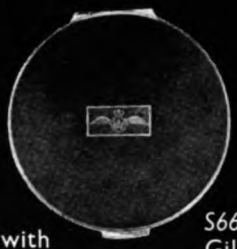

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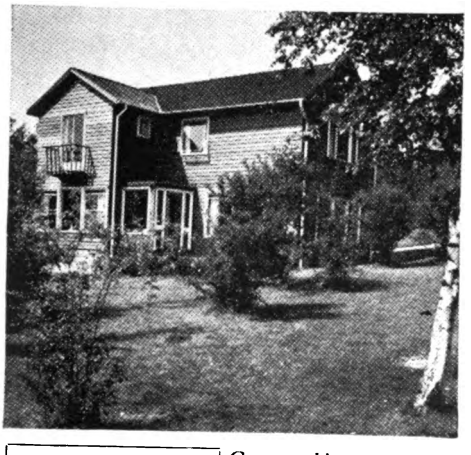

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(INCORPORATING THE JOURNAL "AIR POWER")

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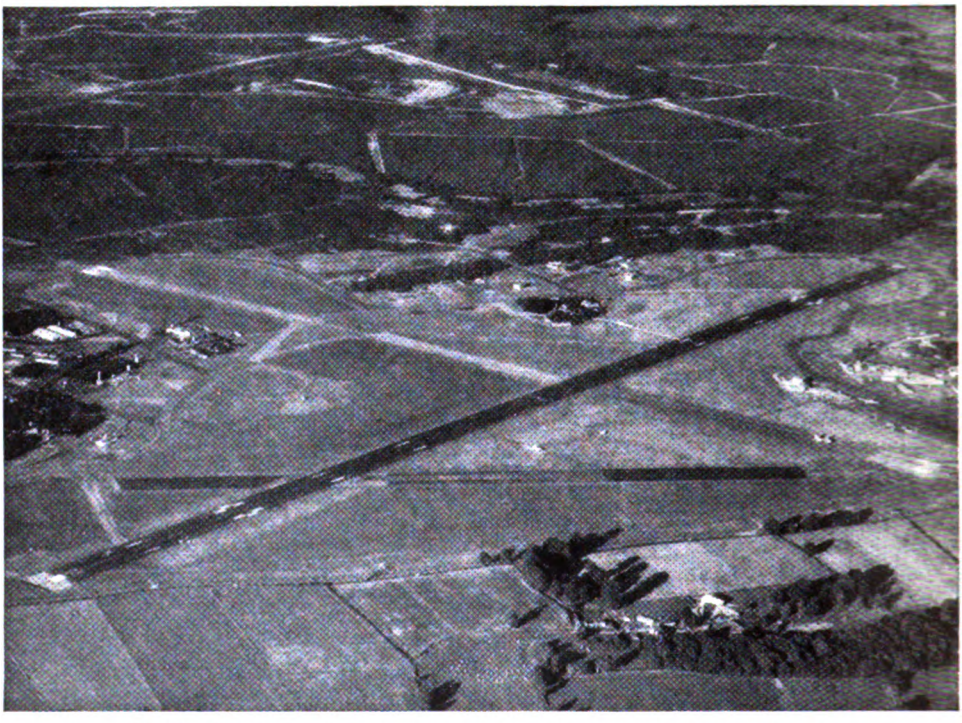

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An Army "SIOUX" pilot is briefed for an armoured car reconnaissance

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(*See article "Peace is an Illusion" page 123*)

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EDITORIAL

THE FUTURE OF BRITAIN'S AIR POWER

HOW easily are even the most obvious and painfully learned lessons of history forgotten by the more self-assured members of a rising generation, and how often does the wheel turn full circle, so that we see repeated the same mistakes, sometimes with dire results.

These rather sombre reflections are prompted by the appearance, in the February issue of the Journal of the Royal United Service Institution, of a fantastic article under the above heading. The author, a retired Wing Commander, combines to a remarkable degree a lack of understanding of recent history with a gift for selecting the evidence that suits his purpose and ignoring all the rest. He is, moreover, a master of the practice of sophistry, which my dictionary defines as "specious and fallacious reasoning," and which has been described as the art of making the worse argument appear the better.

In an over-simplified and misleading summary of the early history of the Royal Flying Corps, the Royal Naval Air Service, and the Royal Air Force, the author ridicules Smuts and Trenchard, whom he regards as mis-guided and even stupid. He quotes a number of Trenchard's sayings—carefully selected and, of course, out of context—in an endeavour to show how foolish he was. Among these are the following:

"The aircraft is the most offensive weapon ever produced," and,

"Today air power decides the issue in every field."

These two remarks, at any rate, were true then, and are still true today.

A biased and inaccurate account of air operations in the Second World War leads the Wing Commander to sum up the strategic bombing campaign in the following sentence: "It is sufficient to say that the area bombing policy broadly failed, whereas precision bombing, normally carried out by the U.S.A.A.F., and occasionally by Bomber Command, succeeded."

It is hard to imagine any statement that could be further from the truth, as even the official History of the Strategic Bombing Campaign, noted for its lack of enthusiasm for its subject, is compelled to admit (Vol. III, page 310).

As a result of this prejudiced and superficial summary, the author feels entitled to conclude that we should revert to our former maritime strategy, which served us well in the days before the coming of land-based air power. He believes that in future air

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power will be used only in support of land and sea forces, and that it should therefore be subordinated to the two older Services, and split up into Army and Naval air arms.

If the author had been born long enough ago to know it by personal experience, or were wise enough to learn it from the facts of history, he would understand that early in 1918, when the harsh reality of war forced us to unify our air Services, air power *was* solely concerned with the furtherance of land and sea operations. This fact had no bearing whatsoever on the paramount need to avoid the waste and misuse inherent in divided air power.

It was true then, and it always will be true, that if you divide your air forces into Naval and Military arms, you lose the ability to concentrate your air power where it is needed. There will almost always be a surplus, relatively unemployed, in one Service, and a shortage in the other.

Field Marshal Montgomery, in a lecture to the R.U.S.I. some years ago, said that if you pull an air force to pieces you destroy its two main assets, its flexibility and its power of concentration.

In addition, and perhaps in the long run even more important, you forego the centralized development, planning, control and direction of air power. It would become subordinated to the limited outlook of those who do not understand how to use it, and regard it as an ancillary weapon, as was the French Air Force from 1914 to 1945, with disastrous results now apparent to all.

Finally, can anyone doubt that but for Trenchard's vision and tenacity in maintaining the integrity of the Royal Air Force, there would have been no Fighter Command to win the Battle of Britain and so save us from defeat, and no Bomber Command to create the conditions which alone made possible our invasion of the Continent in June, 1944, and so pave the way to victory?

Or can there be any reasonable doubt that if the proposals set out in the R.U.S.I. Journal were accepted, Britain's air power would simply have no future at all?

R. SAUNDBY,
Air Marshal (*Ret'd.*).

No. 99 Squadron's 50th Anniversary Celebrations

No. 99 Squadron will celebrate the 50th Anniversary of its formation on the 6th and 7th October, 1967. Will any ex-members wishing to attend please write for details to the Adjutant, No. 99 Squadron, R.A.F. Lyneham, Wilts.

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Air Forces Gulf

By Air Commodore J. G. Topham, D.S.O., O.B.E., D.F.C.
(Air Officer Commanding, Air Forces Gulf)

INTRODUCTION

THE function of Air Forces, and particularly the Royal Air Force, in the area known as the Gulf assume full significance only when related to the very closely integrated British political and economic interests, and to the topographical features of the area which make greater demands on air transport than normal. What therefore are these features?

SIGNIFICANT FEATURES OF THE GULF

Geographical

The Gulf area, throughout which there are coincident and complementary political and military responsibilities, stretches from the independent state of Kuwait, at the head of the Gulf, to Salalah, midway between Muscat and Aden, a distance around the coast of some 1,500 miles. It encompasses the independent Shaikhdoms of Bahrain and Qatar, the seven independent Trucial Oman States, also the Sultanate of Muscat and Oman which is under a personal and patriarchal government.

Economic

In the area something in excess of 186 million tons of oil is produced each year. This is equivalent to half the oil consumption of Western Europe. More than two thirds of this oil comes from Kuwait which is the second largest producer in the world. The balance is found in Abu Dhabi, Qatar and Bahrain. Oil has recently been discovered in Dubai and in Muscat and Oman, and the search continues in other parts of the Gulf.

There are two main refineries in the area, at Sitra in Bahrain and Dhabran on the Saudi Arabian coast some twenty miles away. Saudi Arabia itself, though not included in this economic review, is the largest single producer of oil in the world (producing 118 million tons of crude a year) and a proportion of this passes by underwater pipeline to Bahrain for refining.

The search for and successful exploitation of petroleum deposits has become by far the most important activity in the area. It has created local employment; it has stimulated trade, and it has provided considerable revenue to some of the states for their economic and social betterment. The most striking example is Abu Dhabi where the population numbers some 20,000 and where income from oil is approaching £30,000,000 per annum. Oil is the only real industry in the area, the only other significant occupations being the traditional maritime commerce, pearl diving, cultivation of dates and rearing of camels.

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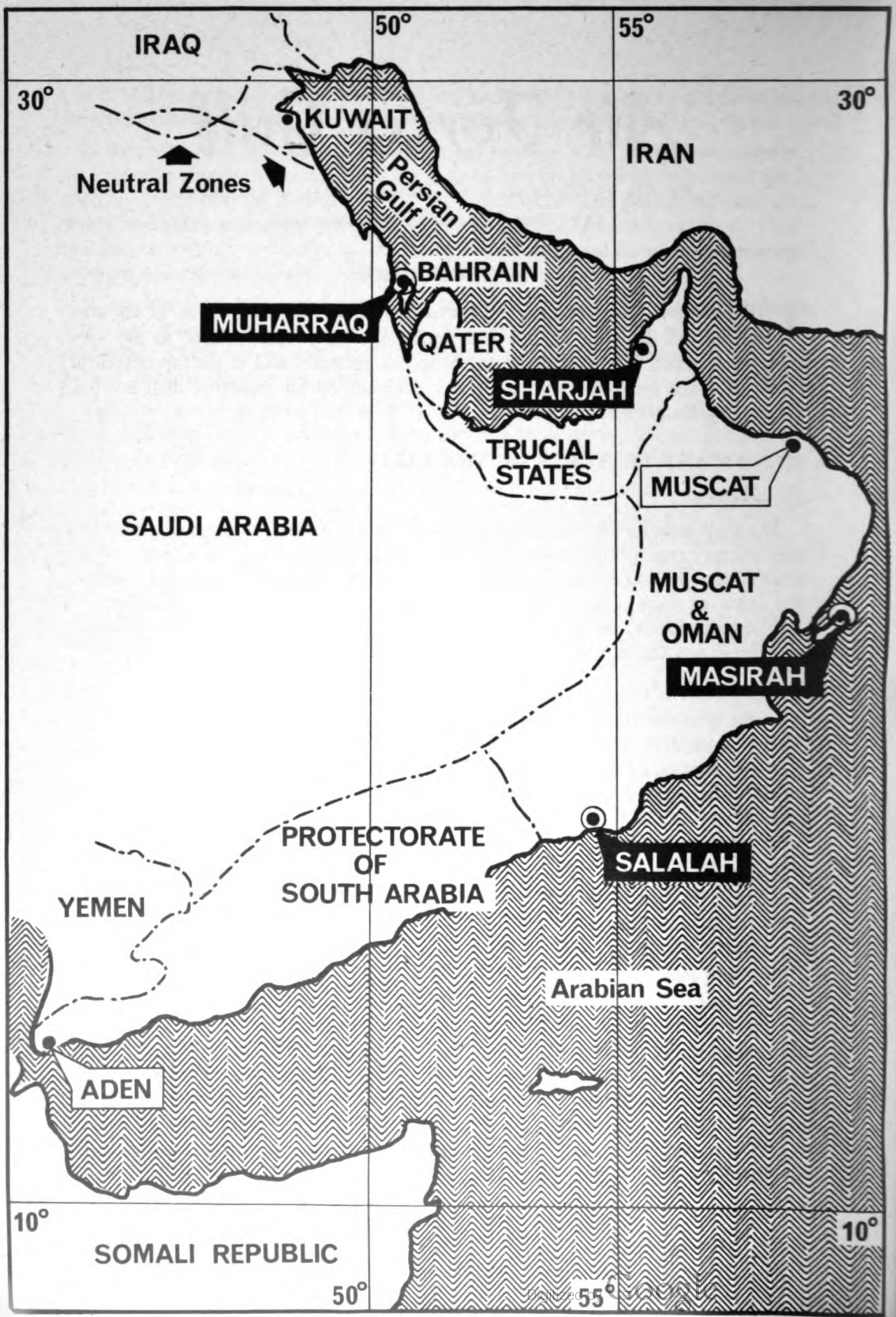
IRAQ
50°
55°
30°
30°
KUWAIT
Neutral Zones
Persian Gulf
IRAN
BAHRAIN
MUHARRAQ
QATER
SHARJAH
TRUCIAL STATES
MUSCAT
SAUDI ARABIA
MUSCAT & OMAN
MASIRAH
PROTECTORATE OF SOUTH ARABIA
SALALAH
YEMEN
Arabian Sea
ADEN
10°
10°
SOMALI REPUBLIC
50°
55°

Population and Terrain

The total population of the Trucial States, Qatar and Bahrain is estimated to be between 300,000 and 320,000. The population of Muscat and Oman is thought to be about 550,000. Outside the principal towns, which have substantial foreign communities, the population consists mostly of Bedou Arabs whose social and political allegiance is primarily tribal.

The Arabian coast of the Persian Gulf from Kuwait south and eastwards is a flat desert of sand and stone broken by shallow inlets off which lie reefs and shoals; except for the Ruus al Jibal promontory (in the strait of Hormuz) whose precipitous cliffs and barren mountains mark one of the hottest parts of the world with temperatures of up to about 120°F. From here mountain ranges run south east parallel with the Gulf of Oman. To the west of these mountains is a gravel steppe which ends in the sands of the Empty Quarter.

The climate is hot and moist in summer but relatively cold for this lattitude in winter. (Temperature in Bahrain, for instance, while being over 100°F generally in the summer drop to the 40°s in winter). There is little rain, but a humid south easterly wind blows in the late summer and autumn. At Bahrain the mean annual rainfall is 2.47 inches; along the Trucial Coast and inland, there is little or no rainfall. Winds are predominantly NW in winter and SE in summer.

In the extreme south of Muscat and Oman are the Dhofar mountains; parts of their south-facing slopes have a relatively luxuriant vegetation in sharp contrast to most of the rest of the country. Here the climate is slightly different. Again, there are two main seasons; summer and winter, but June to October is the " wet " season with an annual rainfall of about 6 inches and more on the windward slopes. Winds are mainly NE in winter and SW in summer. Weather for flying is generally good with occasional lowering of visibility in radiation type fog and sand displacement.

Communications

Except in Bahrain, Kuwait and Qatar which have some surfaced modern roads, land communications are by unmetalled tracks, some of which are suitable for motor vehicles. In the main, the only practicable method of travel to, from and around the Gulf is by air and there are now International Airports at Kuwait, Bahrain, Qatar, Abu Dhabi, Dubai and Sharjah. Additionally there are some hundreds of landing strips throughout the area.

H.M.G.'s RESPONSIBILITIES

Against this background, it is Her Majesty's Government's responsibility to provide forces to honour obligations to support Bahrain, Qatar and The Trucial States against external attack, also to maintain stability by their presence. In the case of Kuwait, an exchange of notes in 1961 reaffirmed the readiness of Her Majesty's Government to assist the Government of Kuwait if defence assistance was requested. Apart from external defence, the special treaty relationships with the Gulf States makes H.M.G. responsible for the conduct of their foreign affairs. This does not apply with Kuwait or with the Sultanate. It is important to note that these are not Colonial territories and that H.M.G. has no responsibility for internal affairs.

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POLITICAL/MILITARY CO-ORDINATION

British political interests and military activities in the area are inextricable, and it is necessary therefore to show how the two are co-ordinated before describing the strictly military chain of command and any single Service function.

H.M.G. has an Ambassador in Kuwait, but elsewhere the main concentration of British influence is in Bahrain, exercised by a Political Resident; at present Sir Stewart Crawford. K.C.M.G., C.V.O. The Foreign Office is also represented in the area by Political Agents in Bahrain, Qatar, Abu Dhabi and Dubai, and in the Sultanate by a Consul General.

Essential co-ordination of British political and military interests is achieved by co-locating the Residency and Joint Forces Headquarters within the same compound at Jufair, Bahrain, and through the Military Co-ordination Committee under the chairmanship of the Political Resident.

The military command, with its new title of British Forces Gulf, will shortly become a fully integrated three Service organisation functioning initially under command of the Commander-in-Chief Middle East Forces and later, after Aden independence, direct under the Chiefs of Staff. The British Forces Gulf Command will have a two-star Commander on a rotational Service basis, the first Commander being Rear Admiral J. E. L. Martin, D.S.C.

THE TRUCIAL OMAN SCOUTS

Responsible to the Political Resident, but not under direct military command of the Commander British Forces, are the Trucial Oman Scouts; a military force which numbers about 1,400, largely Arab, but which includes many British Officers and N.C.O.'s. Its headquarters is at Sharjah. The Trucial Oman Scouts were formed in 1951 when it was found necessary to suppress tribal feuding, usually in connection with boundary disputes. This was seriously retarding progress and development, particularly in respect of oil exploration, and it is to the credit of this force — supported as necessary by resident British Forces in the Gulf — that development throughout the area has been allowed to proceed under secure conditions.

AIR FORCES GULF

The Royal Air Force in the Gulf, with its new title of Air Forces, Gulf, will continue to be an integrated part of the British Military Force and will be commanded by an Air Commodore. It will function both in a "local" tactical air support role and, since the area is strategically placed on the east-about route to the Far East, in support of strategic through movements of air forces, particularly transport forces.

Tactical Air Support

Tactical air support, including routine supply of food, spares, etc., is provided in many forms for the Royal Navy and for the Army, also for the Trucial Oman Scouts. Tactical transport predominates, because of the distances involved and the

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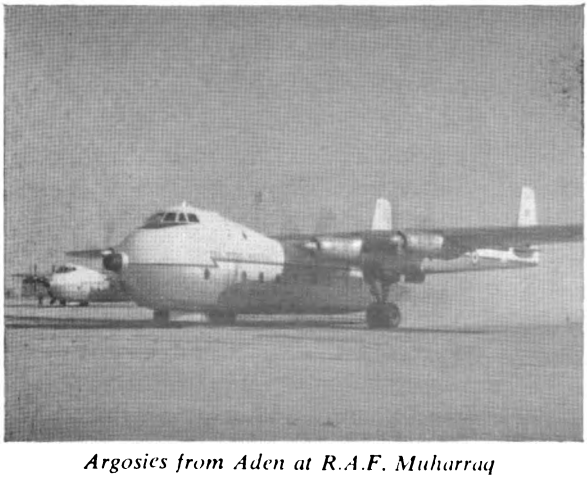
almost complete lack of land communications, and this role will be undertaken by a mixed but complementary force of Argosies, Andover C1s, Pembrokes and Wessex, based at RAF Muharraq and RAF Sharjah, the latter being expanded considerably from its present staging post size. In the area as a whole some 200 or more airfields/strips exist, though few are capable of taking the Argosy. The Andover C1 and the Pembroke have greater flexibility and there are many strips which provide the necessary operating criteria. Operated together with the Wessex, tactical transport support can be provided wherever it is needed.

"Hunter" Aircraft of No. 208 Squadron at R.A.F. Muharraq

Offensive support will be provided by Hunter GA 9s and FR 10s, which include SNEB in their armament, and the force will also have an air defence capability operating with a modern radar environment. A force of Shackletons, operating with units of the Royal Navy, will provide adequate cover of the Gulf waters in connection with arms traffic and assistance to the civil authorities in controlling illegal immigration, and additional reconnaissance tasks will be undertaken by Canberra PR 9s detached on a permanent basis from the Near East Command. A complementary force of ASR Wessex and marine craft will also be included.

Strategic Route Support

The Gulf RAF Stations also feature on the strategic east-about transport and reinforcement route to the Far East. RAF Muharraq is a main S.T. station, already heavily committed to Comet, Britannia and Hastings movements, and fast developing to accept regular through and terminal RAF VC 10 schedules expanding in connection with trooping of service personnel and their families. Freight schedules will also commit RAF Muharraq to handling the Belfast, with Britannia and other aircraft movements continuing as at present.



Argosies from Aden at R.A.F. Muharraq

Detachments of Canberras from the Near East force and from Germany use the

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Gulf stations, particularly RAF Sharjah, for armament practice — where excellent range facilities exist — and for navigation training. Lightning aircraft and Victor tankers, and others, also use the Gulf stations when activating the reinforcement route to the Far East.

Flexibility

Thus, emerging from a history of 30 years in the Gulf, concerned principally with staging support for occasional aircraft movements, the Royal Air Force is now firmly established in the area as a significant operating force vitally involved with all aspects of support for the Royal Navy and the Army, together with other indigenous forces, and as an essential link in the strategic route to the Far East The two main bases are RAF Muharraq and RAF Sharjah. In the Sultanate the RAF man two staging posts, one on Masirah Island, the other at Salalah (Dhofar Province). The latter maintains a close liaison with the Sultan of Oman's Air Force (equipped with armed Provosts and Beaver aircraft flown by seconded RAF pilots) and with the Sultan's Armed Forces, one regiment of which is based at Salalah. Both SOAF and SAF are concerned in this area with suppressing the activities of bands of Dhofari rebels in the neighbouring hills.

The total RAF force permanently based in the Gulf is relatively small in terms of numbers, but by experience gained in handling regularly all types of service aircraft there has been achieved a capability for large scale staging and acceptance of immediate reinforcements should ever the need arise.

Conditions of Service

Only in Bahrain does the Royal Air Force in the Gulf have married accompanied service, and even here the ratio of married accompanied to unaccompanied is small. The allocation of the 200 or so RAF hirings is done strictly on an essential continuity basis and the tour length is two years. Non-continuity/unaccompanied personnel in Bahrain serve a one-year tour, as do all the personnel at the three other RAF Stations. Subsidised cheap leave facilities are established in Beirut, and Cyprus as an alternative is under consideration. For the majority, however, mid-tour leave to the United Kingdom remains the attraction and a special civil return air rate of £65 is in operation. Financial approval is being sought for UK leave to function on a free fare basis.

It is understandable that crash building programmes involved with the re-routing of transport aircraft which followed the denial of overflying rights over the Sudan, together with the expansion of the RAF Stations to accept the greater (post Aden independence) commitments have caused difficult accommodation problems with somewhat restricted amenities. This is not to say that an overseas tour in the Gulf is unpopular; on the contrary, the climate is good with adequate air conditioning during the hot summer months, and recreational facilities are fast improving to normal overseas standards. Relationships with the other Services, with the overseas based civilians and with the Arabs are extremely happy, and above all there is an extremely active and recognised worthwhile job to be done by everyone.

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The Ethics of Bombing

By Air Marshal Sir Robert Saundby, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L.

THE subject of air bombardment is one that is hardly ever discussed objectively and reasonably. It arouses, especially in this country, all kinds of illogical antagonisms and emotional responses. Even when used against a leaking and derelict tanker aground near the Scillies, napalm bombs cause shudders of horror, and one almost expects to see banners in Trafalgar Square "Stop Bombing Defenceless Tankers", and hear the usual fatuous protest from Bertrand Russell.

These irrational feelings are strongest amongst the young and among so-called progressive people, and are almost always directly proportional to their ignorance of the subject. When these people descend to the level of rational argument, the commonest objection to air bombardment is that it involves civilians in war, whereas they have a right to be treated as non-combatants.

The fact is, of course, that civilian populations have always, to a greater or lesser degree, been involved in hostilities. A glance at the history of war will suffice to make this clear.

From the very earliest days of civilization, cities and towns have been beseiged, bombarded, sacked, pillaged and burnt. Often their defenders, and sometimes their civilian inhabitants also, were slaughtered or driven off into slavery. Land battles are not fought in deserts but over the countryside, across farms, houses, orchards and gardens, the property and homes of civilians, who have to flee for their lives.

It is true that with the gradual merging of the feudal into the monarchical order in Europe in the Middle Ages, there came into being for a time a system of conventional warfare, waged by standing armies composed of professional soldiers. During this period the usages, forms, and ceremonies of war were taken very seriously. Generally speaking, a fairly clear distinction was drawn between combatants and non-combatants. This was comparatively easy, because the ordinary people did not take sides as they cared little who won or lost the war. Usually no religious or ideological principles were involved in those struggles for territory between the petty kings, dukes and counts, and the civilian population did its best to carry on with its normal affairs and avoid trouble.

The conventions of war were rather like a set of trade union rules, drawn up to make the profession of soldiering tolerable. Campaigns were normally conducted during the summer months only, and armies went into winter quarters to escape the trials and discomforts of frost, snow and floods. The campaigns themselves were mainly affairs of manoeuvring for position, formal seiges and investitures, all conducted in a regular manner according to the rule book.

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It was against the conventions to try to take unfair advantage by unorthodox actions. Thus it was contrary to the usages of war to attack the base camp or baggage train of an enemy. A vivid and amusing example of the professional soldier's reactions to a breach of these forms is to be found in Captain Fluellen's indignant protest in Act IV, Scene VII of Shakespeare's Henry V.

"Kill the poys and the luggage! 'tis expressly against the law of arms: 'tis as arrant a piece of knavery, mark you now, as can be offered in the 'orld: in your conscience now, is it not?"

But even the professional soldier expected a bonus now and then in the form of loot or rapine, and there were occasions when the civilian inhabitants were plundered, ill-treated, and even slaughtered. Cities were sacked and countrysides laid waste. But such lapses were unusual, and on the whole material destruction was avoided and the rights of non-combatants respected as far as was practicable.

At the end of the eighteenth century a great change occurred. The French Revolution, followed by the rise to power of Napoleon, completely altered the whole character of war. It became the affair of the whole people, and in France the professional army, devoted to conventional warfare, was replaced by the *levée en masse*, the nation in arms. The Grande Armée disregarded most of the conventions, and all over Europe the professional armies of other States went down before its onslaught.

The whole system of conventional war was rapidly swept away, and all nations began to raise large conscript armies. War became far more serious and pervaded the whole life of the nation, and a new and much more realistic concept of military strategy appeared.

This fundamental change in the character of war made a great impression on contemporary students of military affairs, and the German General von Clausewitz clothed in words the theory of war originated by Napoleon. Clausewitz believed that war had finally escaped the bonds of convention, and that in the future, when Great Powers were engaged, it would be total and absolute. It would involve not only the armed forces but the whole nation, and its successful prosecution would therefore need the support of public opinion. He insisted that war, whether we liked the idea or not, was now a violent clash between nations in arms, which could never be humanized or civilized, and that if one side attempted to do so it was likely to be defeated.

He had no faith in the reliability, in time of war, of any international rules or agreements, since no nation, facing the possibility of defeat, would allow itself to be bound by them. It was clear that in total war the distinction between combatants and non-combatants was bound to become blurred.

Alone among the countries of Europe, Britain was able by virtue of her sea power and island situation to avoid the creation of a large conscript army. One of our main weapons was sea blockade, a legal and internationally recognized method of sea warfare, which aimed at starving the enemy nation into submission. Since the armed forces and the essential workers must be fed and clothed, those who suffered most were the women and children, the infirm and the aged. Our blockade of Germany in the 1914 - 18 war caused the death from malnutrition of far more civilians than

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died in all the air attacks on Britain in both World Wars.

In the heyday of our sea power, we not only waged war indirectly against civilians by our sea blockade, but our warships bombarded Copenhagen and Alexandria, and many other ports, and we felt fully justified in doing so. No one, as far as I know, has ever called Nelson or any other of our great admirals a "baby-killer", yet that was the epithet which, encouraged by our Government, we applied to the crews of the German Zeppelin airships in 1914 - 18. Small wonder that we have managed to acquire a national reputation for hypocrisy.

There is thus abundant evidence that, more often than not, the civilian population is deeply involved in war, and that in the past we ourselves have, by our own actions and especially by sea blockade, tacitly admitted this on numerous occasions. On the other hand, our own civilians have tended to regard themselves as privileged non-combatants. Since the Norman invasion of 1066, except for a few civil wars, all our fighting was done on the high seas or in other people's countries. From the end of the 17th to the beginning of the 20th centuries, our sea power completely sheltered our people from the direct impact of war. This encouraged the view that war was exclusively the business of the armed forces, who were paid to fight and risk their lives, while civilians were non-combatants who had a right to be left unmolested to go about their lawful occasions. Their part in the war, they believed, should be limited to waving good-bye to the troops, paying extra taxes, knitting cardigans, mittens, and balaclava helmets, and submitting to a few minor inconveniences.

This comfortable view was shaken by the attacks carried out by German airships and aeroplanes against targets in this country in 1914 - 18, and completely shattered by the all-out onslaught on us from the air in World War II. The coming of the third dimension into war brought about great changes, and another and even more realistic concept of military strategy emerged. The conventions of war that we had come to believe in, however unreal they might have been, were annihilated, and our indignation was even greater than that of Fluellen.

The main focus of this indignation was against air bombardment. It is a curious thing, but condemnation and criticism of bombing began with the very first occasion on which an explosive weapon was dropped from an aircraft. During the Italo-Turkish war in Libya in 1911, Lieutenant Gavotti dropped four bombs on November 1st of that year. These bombs were converted Swedish hand-grenades weighing 4½ lbs. each. Several more such bombs were dropped during the next few days, and before long Turkey protested against the bombing of a hospital at Ain Zara by Italian aircraft. Extensive inquiries failed to establish the existence of a hospital at that place, but it is possible that some Turkish military tents may have been used as a casualty clearing station. The Italians pointed out, not unreasonably, that they had shortly before bombarded the encampment at Ain Zara with 152 heavy naval shells without any protest from the Turks.

There followed in the Italian, Turkish and neutral press a considerable discussion about the ethics of air bombardment; a discussion which has continued, more or less violently, ever since. It is astonishing that the very first feeble attempt at air bombard-

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ment should have provoked an illogical protest, suggesting that a few tiny bombs were more dangerous and destructive than a large number of heavy naval shells.

In Iraq and Transjordan large land forces were replaced in 1922 by small air forces, and a very successful system known as the air control of undeveloped countries was instituted. It did not involve a direct attack on the tribesmen or their houses, but was a form of air blockade. Unlike sea blockade, however, it did not seek to achieve its aim by starvation, but by unacceptable discomfort and inconvenience. The system proved to be so effective, and so economical in money and in casualties (to both sides) that in 1928 it was extended to the Protectorate of Aden where it was an immediate success. The North-West Frontier of India was ideally suited to this humane and efficient form of control, and whenever it was tried there it produced excellent results. The Army, however, with its system of punitive expeditions, was too strongly entrenched and was able to frustrate all attempts to introduce the air method.

As might be expected, there was considerable opposition here at home to the idea of air control. Its opponents had predicted that its reliance on the bomb, which they stigmatized as violent, horrible and inhumane, would leave a legacy of hatred and ill-will. This prediction proved to be the reverse of the truth, and for many reasons air control operations produced far less rancour and ill-feeling than did the former method of punitive action by land forces. Airmen were held in high esteem, and not one of those who fell into tribal hands during air control operations was killed or even badly treated.

Nevertheless, the system continued to be bitterly attacked by many people who had an instinctive horror of any form of air bombardment. Most of these people were sincere and well-meaning, though hardly any of them had the faintest idea of how the system worked, or were even interested in trying to find out. They were reinforced by others, less naïve, who had vested interests in the older methods, and accusations of quelling disorders by "indiscriminate bombing" were made by those who should, and quite often did, know better. But the undeniable improvement in security and public order, and the demonstrable saving of lives and money brought about by air control, blunted these attacks and the system was able to survive. Even today, however, among those who take pleasure in denigrating the very real achievements, in human and economic terms, of our former Colonial Empire, we often hear fantastically untrue stories about our barbarous bombing of innocent tribesmen because they would not pay their taxes!

During the years between the two World Wars the alarm felt by civilians at the prospects of air bombardment led to determined efforts to outlaw or restrict it. At the League of Nations Disarmament Conference, held at Geneva in 1932 - 34, the British Government proposed a Convention to prohibit all forms of bombing from the air, to which it later added a rider permitting its use under certain conditions in undeveloped countries. Further amendments from various sources were added to permit the attack of strictly military targets in support of land and sea operations. But the difficulty of defining what was, and what was not, a military target eventually proved insuperable. Britain then tabled another proposal, limiting the unladen all-up weight

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of military aircraft to 3,000 lbs., which would have ruled out everything but the defensive fighter and the very short-range light bomber. Armies and Navies of many countries welcomed this proposal, and for a time there seemed to be a chance that it might be accepted. But eventually the Disarmament Conference broke up, as such things usually do, without achieving any result whatever.

At the outbreak of the Second World War both the British and French Governments gave instructions that only strictly military targets were to be attacked. The Royal Air Force was not even allowed to attack German warships in docks or at quay-sides, for fear of causing casualties among civilians.

This raised again the question. What is a military target, and how can it be defined? It is generally agreed, for example, that the man who loads or fires a field-gun is a military target. So is the gun itself, and the ammunition dump that supplies it. So is the truck-driver who transports ammunition from the base to the dump. So—in the last two World Wars—was the man who transports weapons, ammunition, raw materials, etc., by sea. But are the weapons and war-like stores on their way from the factories to the bases, and the men who transport them, not also military targets? And what about the weapons under construction in the factories, and the men who make them? Are they not also military targets? And if they are not, where do you draw the line?

If they are military targets, are not the industrial areas, and the services — gas, water, electricity — that keep industry going, also military targets? Where, again, can you draw the line? Or is it permissible to starve these civilian workers by blockade, or shell them if you can get at them, but not to bomb them from the air? This is surely a *reductio ad absurdum*.

As the Second World War went on we and the Americans followed the German lead in attacking from the air industrial areas, power-stations, railway centres, and other essential services, and accepting the certainty of a considerable number of civilian casualties. With very few exceptions our people warmly supported this policy during the war, but as soon as it was won many tried to ignore the vital contribution made by the Allied bombers, and to dissociate themselves from the policy. Bomber Command, as a whole, was denied the 1939 - 45 Star or other campaign star, and given the mainly civilian Defence Medal instead. Its Commander-in-Chief was, in the opinion of many people, slighted; and the Command's achievements were commemorated in an official History written in a singularly equivocal and lukewarm style.

In progressive circles nowadays it is fashionable to assert that the strategic bombing campaign was a mistake, and a waste of valuable resources. Yet even the official History is compelled to admit that "strategic bombing and, also in other roles strategic bombers, made a contribution to victory that was decisive. Those who claim that the Bomber Command contribution to the war was less than this are factually in error."

The truth is that it is war itself that is wrong and immoral, or more accurately speaking aggressive war, for it must be right to defend one's country and oneself against attack. By this standard the war waged by North Vietnam, backed by Russia

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and China, against South Vietnam—fought in South Vietnamese territory, be it noted—is wrong and immoral. On the other hand, the defensive war against the attack from the north, fought by South Vietnam with backing from the United States, Australia, and New Zealand, is right and proper. No twist of argument, no sophistry, no emotional outcry against bombing, can controvert those two plain facts.

It is certainly not intended to imply that all actions, even in a just war against aggression, are necessarily permissible. The test is whether the action in question genuinely furthers the aim and main strategic concept of the war. Thus taking revenge on civilians by mass slaughter does not help to win a war, and is not permissible. But the diminution of an enemy's power to continue the war, by the destruction of industrial areas, power-stations, dams, railway centres and depots is legitimate, even though such action must cause civilian casualties. It goes without saying, however, that all practicable steps, short of prejudicing the success of the operation, should be taken to minimize the risk to civilians.

A study of the subject of this article cannot fail to remind us that we are illogical creatures, still far more swayed by emotion than by calm reason. We have wonderful powers of self-deception, and of the uncritical suppression of unwelcome facts. And we are still capable of believing what we want to believe, in the face of overwhelming evidence to the contrary. Indeed, there are none so blind as will not see, or so deaf as will not hear.

It is, therefore, no doubt unrealistic to hope for the general acceptance of rational views about such an emotive subject as the ethics of air bombardment.

DELIVERY OF ARTICLES TO EDITOR

The *final dates* upon which articles must reach the Editor for inclusion in the Spring, Summer, Autumn and Winter numbers are: —

SPRING (MARCH)	22nd DECEMBER
SUMMER (JUNE)	25th MARCH
AUTUMN (SEPTEMBER)	24th JUNE
WINTER (DECEMBER)	23rd SEPTEMBER

It is sincerely hoped that contributors will not wait until the very last day before dispatching their articles to the Editor, as this can seriously disorganize the works schedule for getting the " Quarterly " to press and could delay its date of issue.

The early delivery of copy would be greatly appreciated.

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Single engine performance
Greater range • More time on Station
Advanced control systems
More powerful • Boat hull safety
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All weather, day and night capability

A bigger and more powerful helicopter for the Royal Navy – the Westland Sea King's greater striking power, endurance and range in the anti-submarine 'hunter-killer' role will make a major contribution to the defence of our sea-lanes.

The latest in a long line of highly-successful Anglo/American co-operative ventures, the Sea King will be built and developed by Westland Helicopters Limited. It will have British engines, and British electronic, automatic flight control and radar systems.

Powered by two Bristol Siddeley Gnome gas turbines, the Sea King is due to enter Service in 1969. Apart from its advanced capability as an anti-submarine weapons system, the helicopter can carry 20 fully-equipped troops in its Commando role.

WESTLAND HELICOPTERS LIMITED
YEOVIL SOMERSET ENGLAND
A SUBSIDIARY OF WESTLAND AIRCRAFT LIMITED

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*AN R.A.F. "WESSEX" RECOVERS A CRASHED ARMY "**SCOUT**"*

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ROLE AND ARMING OF HELICOPTERS

By Wing Commander D. L. Eley, r.a.f.

UTILISATION OF HELICOPTERS

Introduction

DURING the last 15 - 20 years the various roles that helicopters have been called upon to perform have multiplied like rabbits. At first, because of the limitations of power, control, stability, operating costs and reliability they were confined to rescue work and similar specialised tasks beyond the capability of surface vessels/vehicles or fixed wing aircraft. Today, with modern power plants, techniques and materials the helicopter is a serious contender for employment over a wide range of civil and military activities. Civil uses will include such applications as survey, agriculture, engineering construction and maintenance, police, customs and excise, coastguard, commercial and public transport and many others. However, the purpose of this article is to highlight the military applications of helicopters and to facilitate this each Service will be considered in turn. The present and future assigned roles of helicopters will be seen to vary widely over the scope of each Service and although they are considered separately here any future Operation will most likely involve the resources of all three and provide a complete spectrum of helicopter activity.

A Naval "Wessex" brings up the Fire Support

The Royal Navy

The main roles which occupy the helicopters of the Royal Navy are Commando Assault, Anti Submarine Search/Strike, Plane guard and Communications.

The Commando Assault helicopters operating from Carriers such as the ALBION or BULWARK are Wessex 5's. They are very effective in transporting and supporting Royal Marines dealing with a variety of commitments from aiding Civil Powers and small "brush-fire" incidents to major involvements such as the Malaysia/Indonesia confrontation. These helicopter-borne forces can move inland to operate from existing bases, roughly prepared "do it yourself" ones or, alternatively, can operate directly from their

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Carrier if their radius of action permits. In addition to the weapons carried by the troops and the light artillery and vehicles that may be carried as underslung loads, fixed or flexibly mounted machine guns and wire guided missiles can be fitted to the aircraft. In this way a degree of fire support is available directly at any L.Z. Further uses for aircraft so assigned are:

a. Para-dropping.
b. Para-trooping.
c. Armed reconnaissance.
d. Casualty evacuation.
e. Re-supply.
f. Communication.

The Anti-Submarine Search/Strike Helicopters operating from the main Fleet Carriers are Wessex 1 and 3's. Equipped with auto stabilisation they carry Sonar equipment, homing torpedoes or depth charges and sometimes guided missiles. Operations can be carried out by day or night even in marginal weather conditions.

Another helicopter performing this role is the Wasp — a Naval version of the Army Scout. The main differences between the two are a long legged undercarriage with castoring wheels and a folding rear fuselage. The special undercarriage gives ground clearance for the torpedoes or depth charges, its castoring wheels can be locked at 45° to enable the ground crew to pivot the aircraft into wind for a take-off from a small after deck when necessary whilst the folding rear fuselage permits storage in confined spaces.

The SH3D will shortly join the Navy to operate in this role also. This is basically a Sikorsky S61 but is fitted with twin Gnome engines. It has several advantages; for example its flying boat hull will enable it to land on water in an emergency, and its time on station is much improved. Its Radar, combined with Sonar when 'dunking' enables surveillance of the air, sea surface and under-sea space to be maintained.

In general the SH3Ds will operate in pairs from the largest ships, the Wessex from those of intermediate size and the Wasp from the smaller ones.

Plane guard and Communication roles are carried out by Whirlwind 9/Wessex and Sioux/Hiller 12E helicopters respectively. The planeguards are used on airborne standby duties during Carrier operations for the rescue of ditched aircrew whilst the Communications are normal ship-to-shore movements by the light helicopters.

The Army

Radical changes are being made in the Army, regarding the use of helicopters.

Firstly, during the past few years there has been a considerable swing from fixed wing aircraft to helicopters. The number of helicopters in service will soon exceed 400, more than the combined Naval and Air Force strength (The few remaining Auster 9s are now being pensioned off). Secondly, the large variety of types, i.e. Scout, Alouette 2, Sioux and Skeeter will gradually be rationalised to two — the Utility, at present the Scout, and the Light, at present the Sioux aircraft.

Utility helicopters are allotted to independent flights at Corps, Division or Brigade

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An Army "Scout" observing and directing artillery fire

HQs and are deployed as required by their Headquarters. They can be equipped to carry out a wide variety of tasks including logistic support, air trooping, fire support, AFV Search/Strike, Casevac and normal Communications.

Light helicopters are formed into Air Troops; integral parts of their parent Regiments in the major teeth arms. Three of these aircraft form such a troop in all cases except for Regiments of the Armoured Corps which have six. Their roles include: —

a. Observation and Reconnaissance, e.g. site selection for river bridging operations, route selection for armoured penetration of hazardous terrain, siting of artillery and best location for L.W. Radar stations and so on.

b. Artillery Gunfire Control, e.g. fulfilling the traditional role of the old A.O.P. Squadrons in observing and directing gunfire.

c. Target Acquisition and Forward Air Control of Fighter Ground Attack. All Army helicopter pilots are trained in F.A.C.

d. Light Logistics. Many arisings in forward areas involving small numbers of passengers or quantities of freight can be most speedily and economically expedited by the unit light helicopter.

e. Casualty evacuation. Critical time is saved by having Casevac facilities at Unit level.

f. Command and Control, e.g. observation and direction of forces by local Commander from an extremely mobile vantage point.

g. Communications Link e.g. radio relay station covering the whole spectrum of radio frequencies and modern techniques deployed when ground communications are inadequate or air range excessive.

The foregoing list is not exhaustive. Many other diverse tasks such as laying mines or smoke-screens and carrying out clandestine operations can be undertaken when necessary. All these operations are simply extensions of normal Army spheres of activity and should properly be flown by Army pilots.

The Royal Air Force

The roles of the R.A.F. helicopters are broadly divided into two; Search and Rescue and Support.

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The Royal Air Force

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A Trooplift by an R.A.F. Support "Wessex"

Search and Rescue is probably the best known and most widely publicised work of the R.A.F. Whirlwind X and Wessex helicopters are deployed geographically in the U.K. and at certain bases abroad to provide search and rescue facilities primarily for downed aviators but also to give assistance to civilians and seamen in distress on land or sea. Considerable experience is gained by providing the latter service.

Support helicopters consist of Whirlwind X, Wessex and Belvederes (shortly to be replaced by the Chinook) and give close support, in all its forms, to ground forces. This includes: —

a. Trooplifting (including hover-jumping, winching or roping where a landing is impossible due to the terrain).
b. Para-trooping or para-dropping.
c. Resupply (including internal or external load-carrying, winching or absailing).
d. Casualty evauation.
e. Aircraft recovery, as an underslung load.
f. Internal security.
g. Riot control — using tear gas, smoke or small arms when necessary.
h. Leaflet dropping.
j. Communications link.

Role Summary

It has been shown how all three Services are utilising the unique abilities of the helicopter. Each Service has established a need for its own specialised area of operation and "special fit" aircraft; at present these latter add up to 13 different types. These will be reduced, over a period of time, by rationalising them into five general categories of utilisation and purchasing a common type for each Service to use in their specialised application within each category. The categories are: —

a. Heavy lift.
b. Anti-submarine Search/Strike.

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c. Support.
d. Utility.
e. Light.

ARMING HELICOPTERS

Introduction

A modest start has been made in Arming British service helicopters by provision for suppressive fire power from those likely to be engaged in troop support operations. Thus machine-gun fittings are installed on all Naval assault, Army utility and RAF support helicopters in the form of flexibly mounted waist guns firing through cabin doors or windows manned by gunners or crew members. In addition to this general "fit" the Naval Wessex has a fixed forward firing "fit" which can be operated from the cockpit. Many problems lie ahead including the detection and location of enemy fire and aircraft gun/sight stabilisation.

Present development

SS11 wire guided missiles have been successfully fitted and fired from the Whirlwind and the Wessex. The Naval assault Wessex has provision for mounting 2 in. RP Rockets and, as already mentioned, the anti-submarine version carries torpedoes and depth charges.

So far, so good — but why has the progress in arming helicopters been so slow? First of all the weight penalty of the weapons could not be tolerated because of power limitations. Secondly the weight penalty of mountings sufficiently rigid to absorb the recoil of heavy weapons could not be tolerated for the same reason. Thirdly instability and vibration made early machines impracticable as weapon platforms. The fourth and most insidious cause of delay was the influence of a strong school of thought which contended that all helicopters were "sitting ducks" and that flying "low and slow" automatically established that they were unsuitable for use in an unfriendly environment.

Happily the situation is improving. The first three reasons for slow progress have been eliminated by improvements in aerodynamics and technology. The fourth reason has been shown to be invalid as a result of the experience of the French in Indo-China and Algeria, the British in Malaya, Borneo and Aden and the Americans in Korea and Vietnam. It can now be said with conviction that helicopters have a very important part to play in any kind of conflict They have been seen to be able to fly and survive above ground fire or below the skyline and behind natural cover. In addition they can use the full spectrum of speed and manoeuvrability to present a most difficult target to engage.

The latest statistics to support the use of helicopters in the battle area are those arising from the Vietnam conflict. These are many and varied, but whichever figures are used it can be shown that helicopters have a good "survivability" compared with fixed wing aircraft. Of those hit, few are brought down. Of those brought down, relatively few are actually lost either because they can auto-rotate safely into any small clearing or because they can often be recovered as an underslung load and

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repaired. Finally — a high proportion of the occupants are rescued from those that are lost.

The final considerations are, firstly, that it must be accepted that in any kind of conflict some losses are inevitable and that these must be weighed against the value of the achievement. Secondly, the vulnerability to attack must be assessed realistically by differentiating between losses due to flying accidents and those due to enemy action. The third consideration is the logical conclusion that once the case for using helicopters in the battle area is accepted there can be few valid objections to arming them since the armed helicopter is less vulnerable than the unarmed one.

The armaments currently available are briefly outlined, with merits and demerits, in the following table.

MACHINE GUNS	CANNONS	ROCKETS	GRENADE LAUNCHERS	GUIDED MISSILES
High rate of fire	Good lethality	Good lethality	Good lethality	Good range
Easy to fit or remove	Good range	Good range	No recoil	Good lethality
Cheap	Good arc of fire	Low recoil	Limited range	High accuracy
Good arc of fire	Low rate of fire	Easy to fit or remove	Poor accuracy	Adequate arc of fire
Limited lethality	Difficult to fit	Fires single or salvoes	Limited arc of fire	No recoil
Short range	High recoil	Poor accuracy	Special fittings required	Poor accuracy at low level
		Nil arc of fire	Low rate of fire	Expensive
				Special fittings required
				Low rate of fire

Future developments

The next generation of helicopters will have a better all round performance, will be more reliable, less vulnerable and will provide a stronger and more stable weapons platform. Future design throughout the Western world will be greatly influenced by American experience in Vietnam, both regarding aircraft in use and the tactics employed. The following facts are relevant and of interest.

The United States Army is the world's major user of helicopters with over 7,000 machines. More than 2,000 of these are in action in Vietnam and with these there is increasing emphasis on armament coupled with a bolder and more aggressive approach to their use. There is no apparent concomitant increase in the loss rate. In addition to the light defensive armament carried by all helicopters, one in four of the UHI-B's are fully armed gun-ships providing intimate support throughout a convoy of troop carriers. This role is now being taken over by the Huey Cobra, a slimmed down version of the UHI-B. It has a 50% speed margin over the UHI-B and can fall out of convoy, deal with an unexpected opposition, then rejoin and later outstrip the convoy to apply fire power to the L.Z. The armament can be adapted to include any or all of the following: — Two 0.762 mm. Miniguns in pods with a rate of fire up to 6,000 rpm, two pods of 2.75 in. rockets and a chin turret with a 40

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mm. grenade launcher plus a minigun. This aircraft, however, is only a stop-gap until a new machine designed specifically for the task, is in service.

This new machine, designated the Advanced Aerial Fire Support System, will be produced from a firm operational requirement already written and, in fact, the first aircraft, designed and produced by Lockheeds, is due to fly this year. It will be a very sophisticated helicopter with advanced systems for navigation, terrain following and avoidance radar, low light television and also a weapons computer complex. This latter aid, in conjunction with a gunners optical sight and a laser range finder, will enable two targets to be attacked simultaneously with different weapons. The top speed will be 260 mph, initial rate of climb 3,720 ft. per min, and it will have a ferry range of 2,900 nautical miles. The armament will include the M75 grenade launcher in a chin turret, a 30 mm. XM140 cannon in a ventral turret with 360° of traverse and six T.O.W. anti-tank missiles. The role of this aircraft will be to provide fire support for transport helicopter operations. This will include armed reconnaissance by day and night even in marginal weather. Other roles could be postulated such as escorting road convoys, clearing ambushes, engaging small gun or mortar positions, train or tank busting and coastal patrols against small ships. A situation might even arise involving enemy helicopters! Under certain circumstances of terrain and weather gaps in the weight and range of fire support for the ground forces might be filled at short notice by the armed helicopter — However, this last is supposition and very controversial.

CONCLUSION

The helicopter has had a long gestation period since Leonardo DaVinci first conceived the idea of rotary winged flight in the early 15th century. Nevertheless, such progress has been made in the last 10 or 15 years that it is now becoming one of the most versatile means of transport, or medium of air power? It is not impossible that it could revolutionise armies of the future by reducing their dependence on a vast inventory of surface vehicles and ground equipment, stocks of weapons, food, fuel and ammunition, field hospitals and other logistic requirements. Perhaps tanks will become too vulnerable and special paratroops unnecessary. Smaller but more mobile ground forces will be able to concentrate or disperse more quickly by helicopter. Helicopters are flying today with payloads of 25 tons!

The growing speed and ferry range of helicopters is still comparatively limited at present though on the other hand most types are air transportable from one theatre to another.

Navies are finding helicopters invaluable as extensions to ship or convoy radar and anti-submarine defence.

Finally, in Air Forces where the now traditional role of transport support helicopter has not been handed over to the Army, they are using them in greatly increasing numbers.

The helicopter has taken over a multifarious list of roles for the three services. It is now important that neither ignorance, prejudice nor inter-service rivalry are allowed to hinder the fullest exploitation of this rapidly growing form of air power.

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CHINA: Industrial Progress or Aggression?

By J. R. Hickmott

J. R. Hickmott was an Armament Supply Officer with the Admiralty during the war with special duties in connection with electrically operated mines. He has been a regular contributor of technical articles for many years to well known engineering and other journals and has contributed previous articles to the Royal Air Forces Quarterly.

IN THE Communist world the interpretation of a basic doctrine is a matter of adjustment from time to time. What may be applicable to a largely uneducated and unskilled revolutionary is unlikely to have the same impact upon a more sophisticated worker. This is the essence of the differences now apparent between the U.S.S.R. and the People's Republic of China. It would be dangerous to assume, therefore, that these differences are likely to be permanent.

Few reliable figures of China's industrial progress are available but it seems likely that progress to relative equality with the U.S.S.R. will not take a similar period of time to that needed in Russia. Steel production is a good indicator of both industrial and military production and in this connection the figures would appear to be:—

	China tons	per hd. of pop.	U.S.S.R. tons	per hd. of pop.
1958	8 million	.01	58 millions	.24
1965	60 „	.085	91 „	.39

This would suggest that it will take many years for China to reach the same relative position as the U.S.S.R. At this point, however, the comparison may not be satisfactory because the population of China is more than three times that of the U.S.S.R. That is, if China is content with industrialising one-third of her population, steel production per head of industrial population becomes:

1958 = .035 1965 = .26

On this basis China is about five or six years behind the U.S.S.R. in development.

It is estimated that China has between 2½ to 3 million men under arms with a further 12 million reserves or militia. The U.S.S.R. has regular forces of about 3 million with, perhaps, another 3 to 4 million active reserves. These figures also confirm the suggested relative development figures. The essential difference being that China is less well equipped with heavy industry and heavy military equipment. It is not unreasonable to suppose that the nuclear position bears a similar relationship.

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China represents, therefore, a formidable force in the conventional sense and, even if backed only by Russian heavy industry, could sustain a prolonged major military effort that would be difficult to counter without the use of nuclear weapons.

China's efforts in the nuclear field are clearly designed to place her in an adequate deterrent position so that, like the U.S.S.R., her conventional forces can be utilised. In other words it is essential to view the enormous conventional forces of both the U.S.S.R. and China as the basic danger to world peace.

The political intent of the Communists is reasonably evident. That is, to manoeuvre the West into a position where they lack equivalent conventional forces to contain a limited conventional attack. In this context limited attack means something on the scale of a widespread advance into India or South-East Asia.

This would place both the U.S. and the British home bases at more than 5,000 miles from the scene of conflict. To adequately supply a large conventional force by air over this distance would be impossible and it is likely, therefore, that Australia would form the major base for the receipt of seagoing supplies. Even so, the passage to Australia would not be without hazard if the U.S.S.R. utilised its fleet of more than 400 submarines which might be distributed across the oceans of the world. The day may well come when we regret the loss of Malta and Aden as effective staging posts and fighter bases. The African continent must remain a doubtful asset in this respect and it might be that British assistance would have to take the long haul to Australia via the Panama Canal.

The main roads to India are from the East and West. Burma, Thailand, Laos and Vietnam are the flanks to the Eastern approach as well as being the gateway to Australia.

In the ten years ending in 1958 China increased her railway network by 42% to a total of 19,000 miles, roadways by five times to a total of 250,000 miles and waterways by twice to a total of 100,000 miles. It is doubtful if ten years ago Russian equipment for Vietnam could have been effectively conveyed across China in the quantities now being utilised. In fact the whole process can be looked upon as practical experience for the Chinese transport system and an indication of a vastly improved system existing today.

Little is known of Chinese aircraft production. The State Factory at Mukden has for some years been producing Russian M.I.G. and other planes but there is little doubt that several other factories exist.

Whatever the present differences between the U.S.S.R. and China it is essential to attempt to ascertain whether or not the present strenuous military development in both countries is purely defensive and results from fear of aggression from the West.

Fear of aggression in the case of the U.S.S.R. might well be founded on the knowledge that East Berlin and satellite countries are held only by force and that any conflict arising in them might be aided by the West. On the other hand it can equally be suggested that these countries are held by Russia because she fears direct assault from the West. This type of argument arrives at no particular result and, in many ways, confuses the issue still further.

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A common factor to both China and Russia is that both have vast areas of land which are, at present, more or less useless; unless, of course, they contain valuable minerals or fuels. The population increase of China is about 2% p.a. and that of the U.S.S.R. about 3% p.a. These figures must be related to the populations of 700 millions and 230 millions respectively in order to appreciate the magnitude of the increase in actual numbers.

It was suggested above that five years or so would elapse before China could sustain industrially her military forces. This was from the year 1965. It is interesting to note that in that year she increased the length of service in the army to four years, to five years in the air force and to six years in the navy.

Numerically China has more powerful forces than the U.S.S.R. but her actual land frontiers are considerably less if the Russian frontier is ignored. All the evidence suggests that China's political thinking is directed entirely to her own advantages and that coupled with this is a strong resentment of the events of the nineteenth century. Furthermore, she is deeply aware of her past history as a great nation. It must be assumed, therefore, that her hopes and stratagems for the future include leadership in the Far East and, in particular, supremacy over Japan in this respect.

India is in no position at present to defend herself against a Chinese attack and if she is included in Chinese plans for the future it is unlikely that they will await parity.

As yet there is no direct Chinese involvement in Vietnam but the fact cannot be ignored that despite vast U.S. efforts the end of the war is not apparent. This strongly suggests that the Western Powers are ill equipped to deal with this type of warfare and that China alone could provide them with an almost impossible task in India, Pakistan, Afghanistan, Burma, Laos or Thailand. It is universally agreed that if the U.S. had not used the atom bomb against Japan the Second World War would have been prolonged several years. Today the bomb cannot be used any more than poison gas could have been used in the Second World War. The basic N.A.T.O. theory that a conventional war in Europe would be limited to about 14 days before nuclear weapons were used bears little relation to reality unless the Western Powers have already determined to use them at this point.

The simple truth is that Britain today could do little in the event of an attack on India—she has neither the military forces, adequate equipment or suitable staging posts en-route. A combined U.S.S.R. and Chinese attack would probably prevent even the meagre forces and equipment available reaching their destination. This is similar to the position we were in at the commencement of both previous World Wars.

That a Communist attack is something more than a possibility is obvious. The British Government, however, seem to be gambling on immediate U.S. intervention to enable British help to arrive in due course. With the possibility of dozens of U.S.S.R. submarines in the Pacific and the events of Pearl Harbour still within the bounds of possibility the time available might well be inadequate.

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Whatever possibilities the future holds it is certain that domination of a large part of the Far East by Communist forces must mean danger to Africa and ultimately danger to Europe. In the event of Communist aggression we have a simple choice—we either fight at the source or we wait until the battle must be conducted on our doorstep.

Since Hiroshima nuclear weapons have provided nothing more than a breathing space while conventional weapons were being produced by the Communists. They are now relatively no more dangerous than bacteriological warfare or poison gas were previously. In almost every facet Communism is the equivalent of Nazism and the question is not will they attack but when? Korea and Vietnam are the equivalent of the Spanish Civil War and the Italian Abyssinian campaign and represent the testing ground for new weapons and new tactics.

To talk of an initiative for peace in Vietnam is as futile as the appeasement of Hitler; the fighting in Vietnam will cease when it has served its purpose and this seems likely within the next twelve or eighteen months. Then will be the most dangerous period in the history of the world because for a brief moment Communism will hesitate at the brink of decision and at that moment will exist the possibility of peace instead of war.

IMPERIAL WAR MUSEUM

Lambeth Road, LONDON S.E.1

The Imperial War Museum's collection of Historic Aircraft includes a Short 184 Seaplane which carried out a reconnaissance flight at the Battle of Jutland in 1916. No. 8359, built by Westlands of Yeovil, was the first aeroplane to participate in a major action between two battle-fleets. It was severely damaged during a German air raid on London in the Second World War and is now in store.

The Imperial War Museum is anxious that this important aircraft should be preserved and has therefore decided to rebuild it. We have received help from several firms and private individuals, who have kindly supplied photographs and general arrangement drawings. Although such material is invaluable, we also need to obtain the full-size working drawings before we can begin accurate restoration.

So far our search has been unrewarded, but we are pursuing every lead, no matter how tenuous. If any reader could suggest any possible location of such working drawings we would indeed be grateful.

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INTERNATIONAL AFFAIRS

By Dr. C. L. Wayper, M.A., Ph.D.

Dr. Wayper graduated at Cambridge University and took his doctorate there. On leaving the Army he returned to Cambridge where he is now Director of Studies in History and Fellow of Fitzwilliam College and James Stuart Lecturer for the Board of Extra-Mural Studies. He is the author of "Teach Yourself Political Thought" and has contributed articles to various journals and festschrift on International Affairs.

MALAYSIA: THE TRIALS OF A 'STATE NATION'

MEINECKE divided nations into two kinds, the 'culture nation' composed of those who feel themselves to be culturally one even though they may not live in a single state and the 'state nation' made up of peoples who were not culturally united but who were welded into a nation by the state in which they lived. In Asia the Chinese are a culture nation. Malaysians are not. Their's is a state nation in the making and one which illustrates the immense difficulties that are attendant on the making of such nations in the mid 20th c.

Singapore, Malaya, Sarawak and Sabah came together on 16th September, 1963, to form Malaysia. This suited the interests of Lee Kuan Yew, the able Prime Minister of Singapore, who was generally thought to be losing power to the communists. He might, however, hope to win the forthcoming election if Singapore became part of a federation of Malaysia for the thought that the Federal Government would not allow excesses if communists polled the most votes might so encourage those whom fear might otherwise have prevented from opposing them that they would not after all prevail. It suited the interests of Tunku Abdul Rahman who had no desire to acquire more Chinese citizens as he wanted to establish in Malaya the political dominance of the Malays but who had no wish either to see communism triumph in Singapore. By creating Malaysia he could hope to prevent such a communist victory or to restrain it if it happened, while at the same time ensuring that the entry into the new state of the peoples of Borneo would, as it were, dilute or balance the influx of Chinese so that it would still be possible to maintain Malay supremacy in it. Finally Malaysia suited the British too, for it gave them an opportunity of gracefully ending a colonial relationship that had already become anomalous, of doing this before the Chinese became the most numerous of Sarawak's peoples and at the same time of strengthening a Malaya with which they had established very good relations.

But if Malaysia seemed assured of a fair future since it suited so many interests, clouds soon began to gather. Indonesian hostility threatened it without and internal

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tension undermined it within. The external threat might have been expected to restrain the internal tension and to some extent it must have done. The common danger could never have been entirely forgotten and at the very least the presence of British troops meant that policies could not have been hammered out without consideration of British reaction to them. However the warning that we must hang together lest we hang separately loses its urgency if we doubt the imminence of hanging, as the Malaysians did since the British were there to protect them. Therefore while the restraint imposed by the external threat on the internal tensions may have delayed it did not prevent their expression. Perhaps because he was vulnerable, having agreed to accept only 15 seats in the Federal Parliament while Sabah and Sarawak together had 40, to the charge that he had sacrificed the interests of Singapore to keep himself in power, Lee Kuan Yew began to attack the Federal Government, using the slogan "Malaysia for the Malaysians". This apparently innocuous slogan was political dynamite implying as it did that it was "Malaysia for the Malays" which the Federal Government was seeking. A disastrous, if unforeseen, consequence of this attack was the strengthening of the extremist Malays whose influence had hitherto sharply declined. And the tragedy was that at this precise moment something else strengthened them as well. This was the realisation that one of Kuala Lumpur's basic assumptions in entering into Malaysia, the assumption that the peoples of Borneo would support Malays rather than Chinese was unsound. The result was that extremist Malay support grew as Lee's appeal widened until, confrontation notwithstanding and undoubtedly only after the Federal Government had toyed with the idea of arresting him, Singapore was expelled from Malaysia.

In this expulsion Sabah and Sarawak saw proof of the contention that Malaysia was not for the Malaysians but only for the Malays. Bitter and bewildered they remained in the Federation not because they had any love for it but because there seemed nothing else that they could do. With the ending of confrontation their bitterness has not diminished. They have resented the replacing of British troops who provided lavish social services by Federation troops who cannot continue them. They doubt if Kuala Lumpur can or wishes to spend much on what it calls "this legacy of British rule". They have been far from enthusiastic about the sacking of Dato Kalong Ningkan, the Chief Minister of Sarawak, and the proclamation of a state of emergency there. And the arrogance of Malay politicians has not helped in Sabah either where already the Malaysia Day Memorial in Jesselton has the forlorn air of commemorating something long since past and gone. Meanwhile far from there being any sign that Singapore will return to the fold apprehension there grows, and with it tension between it and Kuala Lumpur, as fear of a real understanding between Malaysia and Indonesia spreads, an understanding which might well imply an economic and political squeeze on Singapore.

All this may be nothing more than the growing pains of a new state nation. If it is, then at least it shows how difficult the making of state nations is. It may of course be more, a proof that the making of this particular state nation is not just difficult but impossible. As to that only the future can tell.

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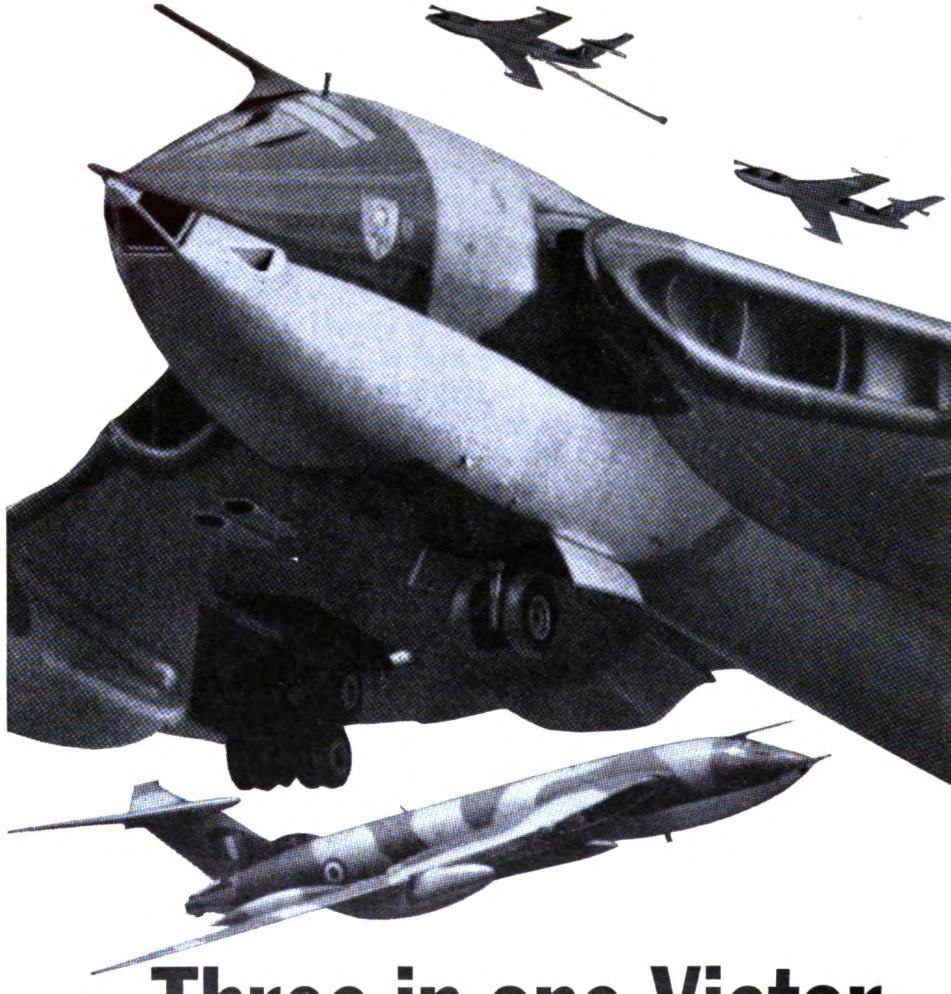

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SOVIET ARMY AND NAVY DAY, 1967

By Wing Commander J. F. L. Long, M.A., R.A.F. (Retd.)

FEBRUARY 23rd is, by custom, a public holiday in the U.S.S.R. when the foundation of the Soviet armed forces in 1918 is proudly marked by country-wide celebrations and in press articles and special broadcasts. The anniversary this year, the forty-ninth, was no exception. The main celebration was held in Moscow in the Soviet Army Central Theatre on the eve of the anniversary at which Marshal Grechko, First Deputy Minister of Defence and Commander-in-Chief of the Warsaw Pact Forces, delivered the traditional address. Previously, according to Radio Moscow, celebrations took place in various raions in Moscow at which Marshals Bagramyan, Sokolovsky, Konev, Sudets, Army General Kurochkin and Lieutenant-General Khalipov spoke. A novel feature on this occasion was a link-up on February 22nd of the Hero Cities of the Soviet Union for reportages of festivities taking place in them. On the same day, the television service arranged a hook-up between the fleets in Kalingrad, Murmansk, Sevastopol and Vladivostok. A carefully co-ordinated and intense publicity campaign, which included a press conference given by Army General Kurochkin on the 20th and a television talk by Marshal Chuikov on the 22nd, reached its climax on Army and Navy Day itself, when the central and regional press devoted considerable space to articles by well-known military leaders. Although he issued a customary order of the day and contributed an article to *Pravda* on February 23rd, the U.S.S.R. Minister of Defence, the late Marshal Malinovsky, who was reportedly gravely ill, made no appearance at any of the public ceremonies.

This year's holiday gave promise of being something out of the ordinary. Not only was it, in a real sense, the first of a series of important preliminaries to the celebration of the fiftieth anniversary of the 1917 Revolution in November, but it happened to fall at a time when the Soviet Union found its relations with China at their lowest level since 1949, when its leverage on the situation in Vietnam was, in some respects, more dependant upon Chinese favours than it was a year ago and when its opportunities for manoeuvre vis-à-vis the U.S.A. were extremely limited. Almost on the eve of the anniversary, the U.S.S.R. was obliged somewhat abruptly to face the consequences of the immobility of its policy on the German question as a result of West Germany's initiatives to bring about an improvement in its relations with the countries of Eastern Europe. Failures of this magnitude, of course, made poor grist for the publicity mill. So the failures tended to be treated as examples of hostile manoeuvres by imperialism and the revisionist splitters of the Communist movement which, in turn, served to buttress arguments showing how the promise of the 1917 Revolution was being gloriously realized through the U.S.S.R.'s current internal and external policies, backed by the might of the Soviet armed forces.

The state of the armed forces today occupied an important place in practically all press and radio comment. Although the need for strengthening the forces was

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stressed constantly, as last year, the need for strengthening them *in every conceivable way* was not. Nor was the cost in cash terms emphasized, as it was before the big Warsaw Pact exercise last autumn. Nor was there any pronounced tendency to stress the need for deploying *greater* strength than the enemy, as Marshal Grechko did in February, 1966. Rather was the accent upon the adequacy of Soviet defence measures, which, said Marshal Moskalenko in a talk broadcast to Italian listeners, were at a level to allow "the Soviet people to build Communism peacefully." One sensed in these formulations a certain note of confidence, possibly reflecting the satisfaction of a majority of the military leaders that the case for increased budgetary allocations on defence had been accepted for the present by the political leaders[1]. It was also noticeable that the strident ideological tone heard last year was largely missing this, although attention was paid, as is customary, to such themes as the leading role of the party in the armed services and the importance of sound ideological training at all levels.

Qualified Comments on the ABM

In view of the publicity which the deployment of an ABM system by the U.S.S.R. has been accorded in the West, it was to be expected that any allusions made by Soviet spokesmen on this occasion should have caught the eye of Western correspondents. Reporting tended to be piecemeal and often rather lacking in perspective. The Soviet ABM is hardly a new phenomenon on the military horizon, nor was it only yesterday that high-ranking Soviet officers began to speak about it. Indeed, it has been evident, at least since the time of Khrushchev's ouster in October, 1964, that not all military leaders have unreservedly accepted the claim that it is really possible to "hit a fly in space." It is clear, for instance, from the qualified comments that have been made from time to time that certain military leaders have not been particularly impressed to date by the performance of the Soviet weapon in ideal test conditions, or, if they have been impressed, they are not ready to jump to the conclusion, as Khrushchev did, that in operational (i.e., global war) conditions the weapon could be absolutely relied upon. To this school of thought belongs Marshal Chuikov, head of the Soviet civil defence organization, who almost two years ago publicly voiced his doubts about the feasibility of shooting down every hostile rocket and, more recently, has gone out of his way to draw attention to the obvious but important point that the protection of the civil population could not be guaranteed against radioactive fall-out and incoming missiles in the absence of certain essential preparatory measures (shelters, training, etc.). Others, like Army General Batitsky, recently appointed commander-in-chief of the Soviet air defence forces, have been careful not to exaggerate the extent of the ABM deployment, insisting that only certain important targets would be covered.

On this occasion three (possibly four) distinct positions were taken up by military spokesmen. The U.S.S.R. Minister of Defence, the late Marshal Malinovsky, and his

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Shadow of Vietnam?

Standing out in sharp contrast to the comments of all his colleagues were those made by Army General Kurochkin, the head of the Frunze Academy, at a press conference in Moscow on February 20th. In reply to a correspondent's question, he was reported by Radio Moscow's service in English to the United Kingdom to have said that the destruction of hostile missiles in flight presented no problem to the Soviet Union. According to an AP report of the same date, after declining to provide details of the ABM system, he said: "If the rockets fly, they will not reach their targets." But Radio Moscow, in reporting the general's press conference in its domestic service, pointedly ignored these remarks. It would obviously be unwise to push inference too far on the strength of evidence of this sort, as certain reputable journals have tended to do, but, equally, it would be foolish to ignore it. On balance, this evidence would appear to suggest that, far from there being a general measure of agreement, numerous doubts exist at the highest military level about the capability of the ABM system now being deployed. Some military leaders may possibly take the view that it would have been wiser, on military grounds, not to deploy the present system.[2] What is certain is that the supporters of the conventional formula are still very far from persuading ABM optimists (like Kurochkin) and pessimists (like

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Submarine Missile Fleet Upgraded

No less puzzling, in some respects, were the descriptions of the U.S.S.R.'s deterrent force. In the main, variations of the stereo-type which brackets the Strategic Missile Forces with the missile-carrying nuclear-powered submarine fleet as the principal components of the deterrent force were favoured. The late Marshal Malinovsky, author of the stereotype[4], used in it an article in *Pravda* on February 23rd, as did Marshal Grechko in his address on the 22nd, Army General Kurochkin at his press conference on the 20th and Army General Batitsky in his TASS review of the same date. Marshal Bagramyan, in his radio talk, using a somewhat expanded version of the formula, appeared to set the Strategic Missile Forces *above* the missile-carrying submarine fleet, although he was careful to emphasize the strategic character, as he put it, of the fleet's tasks. By contrast, the official guidance provided for political officers through the columns of *Kommunist Vooruzhennykh Sil*, the journal of the Main Political Administration of the Soviet Armed Forces, did not directly link the missile-carrying submarine fleet with the deterrent force, mentioning it at the end of a paragraph devoted to a description of improvements in branches of the services *other than* the Strategic Missile Forces, which were treated earlier in a paragraph on their own. Aside from nuances of this sort, there were numerous indications that priority attention was being given to both components of the deterrent force, as the late Malinovsky seemed to suggest in a *Kommunist* article of January.[5] The hard facts were few, but there were allusions to (a) the development of "essentially new types of missiles" in recent years; (b) "new nuclear-driven submarines, equipped with ballistic rockets"; and (c) the introduction of "the latest radio-electronic aids" in the underwater fleet.[6] When read in context, the reference to *new* missile-carrying submarines is not precise enough to be taken to mean that the development of a true Polaris-type submarine is contemplated or underway.[7] Unlike their East German counterparts, Soviet military spokesmen do not yet wish to go further than vague, generalized formulations.[8]

Of far-reaching significance, however, was the brief reference by Marshal Zakharov to the introduction of radio-electronic aids in the submarine fleet. This is not a matter

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The Soviet Long-Range Air Force

Finally, it is noteworthy that references to the Long-Range Air Force, the other important offensive branch of the Soviet armed forces, were few and of too generalized a nature to allow inferences to be drawn. Many influential military writers and speakers chose to ignore the Long-Range Air Force altogether. Not even the Commander-in-Chief of the Soviet Air Force, Chief Marshal of Aviation Vershinin, in answering questions put to him by *Soviet Military Review* about the problems facing military aviation today, thought it unnecessary to mention the force specifically, although he had much to say about the importance of the manned aircraft in modern war.(11) The official guidance provided by *Kommunist Vooruzhennykh Sil* referred only briefly to "missile-carrying aircraft" without giving an indication of type or role.(12) General Kurochkin, at his press conference, apparently did not mention the Soviet Air Force at all. The late Marshal Malinovsky, however, in his *Pravda* article, emphasized that, qualitatively, the Long-Range Air Force had changed, although he did not say in what way(13), nor did he describe the force as a principal component of the deterrent force. Marshal Grechko, in his address on the eve of the anniversary and again in his *Izvestia* article of February 23rd, employed the conventional formula that the "nuclear power of long-range missile-carrying aircraft" had increased, but he did not suggest that these aircraft were to be found in units of the Long-Range Air Force, although his remarks could be taken to mean this. Marshal Bagramyan, in his talk to Radio Moscow's domestic audience on February 22nd merely claimed that Soviet supersonic missile-carrying aircraft possessed a low-level and inter-continental flight capability, which permitted them "to inflict nuclear blows on an enemy's most important targets." Not even a soothsayer in Ancient Rome could be expected to read signs as insubstantial as these.

(9) See article by Vice-Admiral Tolstolutsky on naval communications, *Krasnaya Zvezda*, July 27th, 1966, briefly referred to in the article "Shifts in Russia's Strategic Posture" (*Quarterly*, Winter 1966, p. 302). The main points in Tolstolutsky's article are given in *Wehr und Wirtschaft*, February, 1967.

(10) TASS domestic dictation speed bulletin in Russian, February 20th.

(11) *Soviet Military Review*, No. 2 (1967), pp. 18 - 23 (published in Moscow in English and French only).

(12) p. 35. On the preceding page, there is a rare reference to the total weight of bombs dropped "on the heads of the fascist invaders" in the Second World War (700,000 tons).

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that has so far attracted much attention in the Western press and on this occasion Zakharov was not sufficiently specific for his meaning to be perceived easily. But his allusion was almost certainly to the entirely new system of communications and control which is being introduced into the Soviet Navy as a first step in a long-range plan for integrating the communications and control systems of all branches of the armed forces.(9) One of the first objectives under this plan has been to bring the underwater fleet, even when operating at great depths, into continuous contact with base by providing it with communications that are accurate, extremely swift and secure. Zakharov's statement may suggest that the underwater fleet now possesses this capability and this is borne out by the claim of the Radio Moscow commentator Pimenov that the fleet, or at least that part of it which participated in the round-the-globe underwater cruise at the beginning of 1966, "maintained constant contact with command".(10)

The Soviet Long-Range Air Force

Finally, it is noteworthy that references to the Long-Range Air Force, the other important offensive branch of the Soviet armed forces, were few and of too generalized a nature to allow inferences to be drawn. Many influential military writers and speakers chose to ignore the Long-Range Air Force altogether. Not even the Commander-in-Chief of the Soviet Air Force, Chief Marshal of Aviation Vershinin, in answering questions put to him by *Soviet Military Review* about the problems facing military aviation today, thought it unnecessary to mention the force specifically, although he had much to say about the importance of the manned aircraft in modern war.(11) The official guidance provided by *Kommunist Vooruzhennykh Sil* referred only briefly to "missile-carrying aircraft" without giving an indication of type or role.(12) General Kurochkin, at his press conference, apparently did not mention the Soviet Air Force at all. The late Marshal Malinovsky, however, in his *Pravda* article, emphasized that, qualitatively, the Long-Range Air Force had changed, although he did not say in what way(13), nor did he describe the force as a principal component of the deterrent force. Marshal Grechko, in his address on the eve of the anniversary and again in his *Izvestia* article of February 23rd, employed the conventional formula that the "nuclear power of long-range missile-carrying aircraft" had increased, but he did not suggest that these aircraft were to be found in units of the Long-Range Air Force, although his remarks could be taken to mean this. Marshal Bagramyan, in his talk to Radio Moscow's domestic audience on February 22nd merely claimed that Soviet supersonic missile-carrying aircraft possessed a low-level and inter-continental flight capability, which permitted them "to inflict nuclear blows on an enemy's most important targets." Not even a soothsayer in Ancient Rome could be expected to read signs as insubstantial as these.

(9) See article by Vice-Admiral Tolstolutsky on naval communications, *Krasnaya Zvezda*, July 27th, 1966, briefly referred to in the article "Shifts in Russia's Strategic Posture" (*Quarterly*, Winter 1966, p. 302). The main points in Tolstolutsky's article are given in *Wehr und Wirtschaft*, February, 1967.

(10) TASS domestic dictation speed bulletin in Russian, February 20th.

(11) *Soviet Military Review*, No. 2 (1967), pp. 18 - 23 (published in Moscow in English and French only).

(12) p. 35. On the preceding page, there is a rare reference to the total weight of bombs dropped "on the heads of the fascist invaders" in the Second World War (700,000 tons).

(13) Marshal Malinovsky made no reference to the L.R.A.F. in his article in *Kommunist*, No. 1 (1967).

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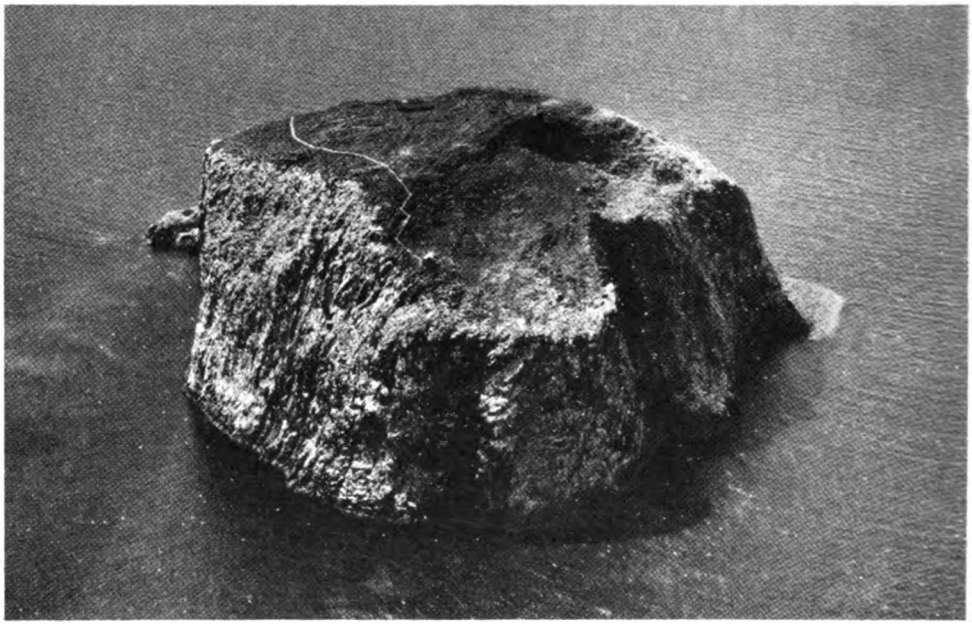
If the Royal Air Force wanted this rock as a tactical strike base they could move in tomorrow with their V/STOL Hawker Siddeley P.1127's



The trans-sonic P.1127 close support aircraft makes nonsense of conventional static air bases. It needs no airstrip.
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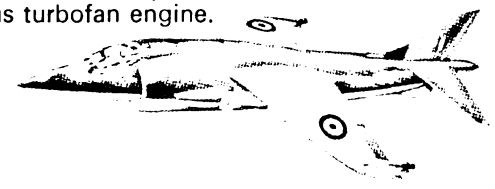

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PEACE IS AN ILLUSION

THE STORY OF THE R.A.F. REGIMENT

The Early Years

AS the Royal Air Force was reshaped into the Trenchard pattern during the difficult years which followed the establishment of the new Service, it sought — and acquired — new responsibilities in the protected and mandated states of the Middle East. Then, as now, the dominant factor was one of economy, and because of its greater cost-effectiveness the doctrine of air control was allowed to replace the tenet of military occupation by imperial garrisons. But experience soon showed that even under the most favourable conditions it was necessary to have small ground forces to supplement and consolidate air operations, and so the Royal Air Force's own armoured car companies were formed soon afterwards. These units were involved in a variety of operations in Palestine, Trans-Jordan, Iraq and Aden in the inter-war years, and the experience gained there was invaluable when they moved to the Western Desert to support the forward squadrons of the Desert Air Force in what was to become the classical prototype of tactical air force operations. Although only three armoured car companies were formed in the 1920s, they were assisted by locally-enlisted forces which were raised by the Royal Air Force and officered by British officers seconded from the Army. These forces were the Royal Air Force Levies (Iraq) and the Aden Protectorate Levies.

Meanwhile, in theatres outside the Middle East, it had been tacitly assumed that any major war in the future would conform to the static, positional pattern established in France between 1914 and 1918, and that aircraft would always have secure bases from which to operate. These ideas were soon dispelled by the harsh facts of modern war and it was amply demonstrated that tactical air operations could not be conducted effectively unless the air commander was provided with his own ground forces for the close defence of his forward airfields and exposed installations such as tactical radars. Equally, in mobile warfare, these same ground forces were needed to seize new airstrips — often in advance of our own army — if the momentum of the land battle was to be maintained by the provision of continued close air support.

For these — and many other — reasons the Royal Air Force Regiment was established by Royal Warrant on 1st February, 1942.

The Second World War

The part played by the Regiment in every theatre of operations has been fully documented in the official histories which have recorded the contribution which Regiment squadrons made to the success of tactical air force operations in Europe, the Middle East and the Far East. A measure of the importance of these tasks can

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Personnel of an R.A.F. Regiment Squadron carrying out Jungle Training
(Ministry of Defence Photo)

be gauged by the size of the Regiment at this time — 85,000 officers and airmen, and an operational force of some 240 squadrons throughout the world. Nevertheless, the permanent retention of a ground fighting force within the framework of a peace-time air force was far from certain, and it was not until the detailed investigations of the Barratt Committee had been completed and its report studied by the Air Council that the decision was taken in 1946 to retain the Royal Air Force Regiment as a branch of the post-war air force.

Peace and Cold War

Immediately its future was confirmed, the Regiment was re-organized into armoured car, rifle and light anti-aircraft squadrons, and its units were re-numbered in a new sequence. The greater part of the force was deployed overseas although officer and NCO instructors were posted to stations and training establishments in Great Britain so as to train officers and airmen of all other branches and trades in the arts and skills of active and passive ground defence.

In Palestine in 1947 the Regiment began its involvement with sabotage, terrorism, guerrilla warfare and overt attack on Royal Air Force installations and personnel— which has continued unabated to the present day. Every post-war clasp to the General Service Medal can be found in the ranks of the Regiment, which also set the precedent for British involvement in United Nations' peace-keeping operations by separating Greek and Turk when internecine fighting broke out in Cyprus.

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In the Far East, the Royal Air Force Regiment (Malaya) joined the roll of locally-raised forces under Regiment command, and their six squadrons were soon deeply involved in the Malayan Emergency. However, by the end of the 1950s the changing pattern of international affairs and the transition of dependencies to independence led to the loss to the Royal Air Force of all three associated overseas forces with the result that the RAF Regiment had to shoulder an increased burden in those areas. Despite this, the Regiment airman's morale remained high as he accepted that his role in life was to serve mainly overseas and carry out a miscellany of arduous, unpleasant and dangerous tasks wherever the Royal Air Force was required to operate or maintain a presence for political reasons. Had Kipling been born a little later, he might perhaps have attributed his lines: —

"When the Children of Israel made bricks without straw,

"They were learnin' the regular work of our Corps,"

to the Royal Air Force Regiment and not the Royal Engineers!

Present-Day Tasks

Apart from the officer and NCO instructors spread throughout the Royal Air Force, staff officers at the Ministry of Defence and other headquarters, and personnel on exchange posting to other air forces, the Regiment today comprises twelve field and low-level air defence squadrons. One of these units is permanently employed on public and ceremonial duties for the Royal Air Force as a whole, and is based at Uxbridge — although it travels widely — and is known as The Queen's Squadron. Another squadron is trained and equipped as a parachute squadron, and is normally retained as part of the United Kingdom-based strategic reserve which is held in readiness for emergency operations overseas. The remaining ten squadrons are divided between home and overseas theatres; those abroad provide the immediate forces necessary for the support of air forces based in that theatre, whilst those at home are maintained at a high state of readiness for overseas reinforcement.

In addition to these major tasks, Regiment personnel are involved in a number of other important duties within the Royal Air Force. First and foremost is the provision and manning of airfield crash/rescue fire services—a duty which ensures that the Regiment is represented wherever the Royal Air Force operates its aircraft. Gunners are also found as integral members of the ground component of VTOL and STOL squadrons, particularly those within No. 38 Group. When helicopters flying in operational areas are armed, the aircraft guns are normally manned by Regiment airmen. Opportunities for parachuting are enhanced by the fact that, in addition to providing specialist personnel for the Command para-rescue teams in NEAF and FEAF, the Regiment squadrons in these theatres maintain their own parachute teams for emergency action in support of operations.

The versatility of the Regiment extends into other fields too: because of their responsibilities for nuclear, chemical and biological defence within the Royal Air Force as a whole, Regiment personnel participated in the British series of nuclear tests where they carried out radiological monitoring, radiochemical analysis, health physics and the decontamination of personnel, equipment, vehicles and aircraft.

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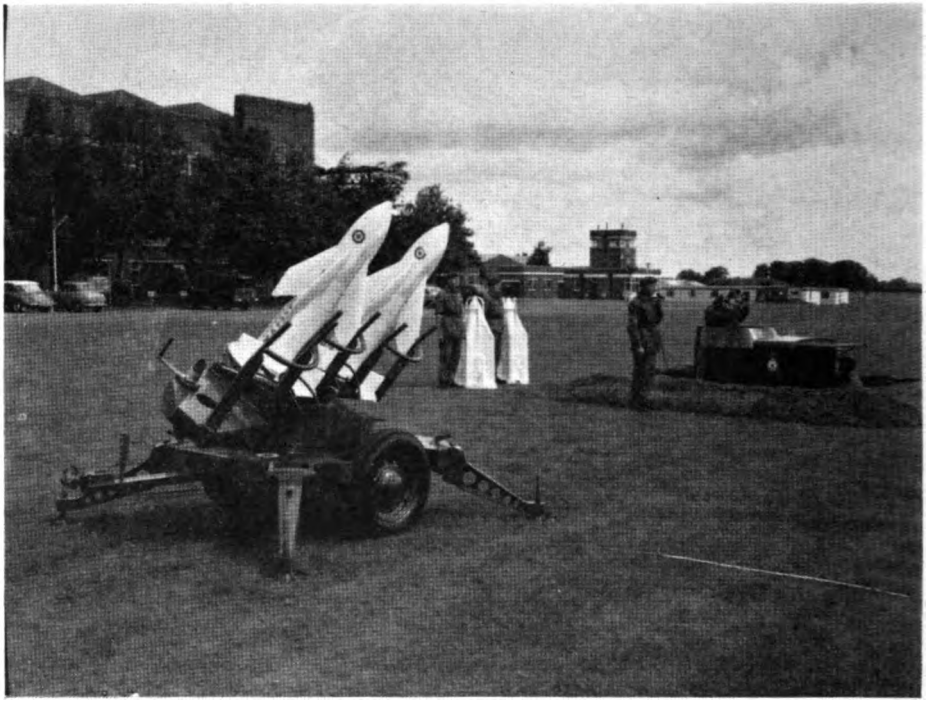

R.A.F. Regiment Detachment with the Tigercat Missile
(Ministry of Defence Photo)

The Royal Air Force Regiment has its Depot and main training centre at Catterick, in Yorkshire, which is an airfield with historical associations dating back to 1916. Besides being the home base for the squadrons of the Strategic Reserve, Catterick provides the specialist training facilities for officers and airmen of the Regiment. The wide variety of courses which are run include a number of catering for personnel of other branches of the Royal Air Force, as well as for members of the other Services. Whilst the majority of new officers—in common with other branches—enter the Regiment via the Royal Air Force College, Cranwell, together with the cadets of the other four main branches.

The Royal Australian, Canadian and New Zealand Air Forces have ground defence elements similar to the RAF Regiment. The United States Air Force are at present organising a comparable force.

The Future

Untrammelled by the traditions of centuries, the Regiment looks ahead to the challenges of the future with confidence. It is being developed to absorb changes in technology and techniques so that it will continue with high efficiency to provide a heavy punch with small numbers and a very high "teeth to tail" ratio. The introduction of new ground defence weapons and low level surface-to-air guided missiles, coupled with even better communications, mobility and air portability will support the increasing strength of tactical air power in the cold and limited wars of the future.

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BATTLE AGAINST DISEASE

By Flight Lieutenant Russell Properjohn

(with R.A.A.F. in Vietnam)

Sergeat Mike Chapman of R.A.A.F. in Vietnam, plays his voluntary part in Medical Aid to Vietnamese children

(RAAF Photo)

VUNG TAU, SOUTH VIETNAM—The battleground in the war for hearts and minds in this area of Vietnam nestles in the bays and inlets of the South China Sea.

Most Sundays of the year they are invaded. A dozen R.A.A.F. men armed with medical supplies, food, know-how and goodwill do battle with the dirt and disease which plagues the life of the peasants in villages like PHUOC LAM, PHUOC TINH, LONG SON and LONG HAI. They call them MEDCAPS — medical civil aid programmes —and they are becoming a familiar part of life in the villages. Leading the R.A.A.F. Medcap teams is Dr. Ian Favilla, the medical officer at the R.A.A.F.'s VUNG TAU base. Often he is joined by a U.S. Army or Navy doctor or dentist, and Dr. Don, a Vietnamese.

Sunday is the one day of the week off for the men of the R.A.A.F. It is given willingly by men like medical orderly Sgt. Dave Carr, interpreter Pilot Officer Dave Perkins, and airframe fitter LAC Robin Gee.

Those who don't have the medical knowledge wash babies, apply ointments and antiseptic to skin infections, dispense food, soap and sweets. Most of the children who attend suffer from some type of skin infection and need penicillin injections. Many of the sores and infected areas are in a shocking state of neglect. Medcap is no job for a man with a weak stomach.

It is unfortunate that the Medcap teams are forced to carry arms on their missions of mercy. But the Viet Cong regard Medcap as psychological warfare and may attack

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Flt./Lt. Bill Shepherd, R.A.A.F. Helicopter Pilot of 9 Squadron, voluntarily flies aid to Vietnamese children.

the teams. The Viet Cong have not attacked a Medcap team yet. But they have ambushed an Australian Army civil aid officer who was building too much goodwill in the village of HOA LONG. They missed, and his work goes on. So the Medcap teams go armed. Dr. Favilla carries his medical bag and an American M1 carbine. The weapons are ignored by the Vietnamese who accept them as a part of normal, everyday life. They have been involved in war for a long time.

Early in the morning the team pushes out into the South China Sea in armed junks of the Vietnamese Navy Junk Force. Each grey junk has two red eyes painted on the prow, so the vessel may find its way across the sea. R.A.A.F. cooks prepare sandwiches for the trip. Like Australians everywhere, the team takes a supply of iced, canned beer and soft drinks. It is a two-hour trip to LONG HAI, a village huddled at the foot of hills which are a known haven of Viet Cong guerrilla bands.

A small Cessna "bird dog" aircraft skims low over the town and surrounding area. If the pilot spots anything or draws fire the Medcap team will pull back quickly to a more secure area.

The team sets up in a small compound near the centre of the bamboo hut living area of the poorer villagers. For half an hour business is slow. This is the first visit to this village. Then the word spreads. Mothers, their fear banished by the maternal instinct common to all mothers, are the first to appear with their children in their arms. The older children gather, whispering and pointing. "Uc Dai Loi" (Australians) they tell each other. They roar with laughter as Pilot Officer Perkins jokes in Vietnamese, and clutch eagerly at sweets as their brothers and sisters are washed and treated.

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Dr. Favilla argues with an old woman who refuses to take a spoonful of medicine. She says she has been to see a Chinese herbalist. Grudgingly she swallows the mixture, and walks off happily clutching a bottle of the same.

The U.S. Navy dentist shakes his head as he inspects a mouth. Half the teeth are broken and discoloured, the other half gold. The gold teeth replaced good ones, and were inserted by the village jeweller, not very skilfully. There is a marked absence of men. They send their wives and daughters for treatment, and if all goes well they may appear the next time the Medcap team visits LONG HAI.

After treatment the women are given boxes of baby food and cakes of soap. Dr. Favilla says most of the children's skin problems would be eased if they were scrubbed regularly and attention was paid to basic hygiene. Pilot Officer Perkins gives each a short lecture on hygiene, with instructions on how to take the medicine.

It seems the whole village turns out as the Medcap team leaves. Small fishing boats take them in relays to the junks, anchored off-shore.

After a three hour trip the team arrives home weary but rewarded. To the Viet Cong it may be straight-out psychological warfare, but to the Australians it is more. They do it voluntarily.

NOTICE TO CONTRIBUTORS

To avoid the unnecessary cutting and sub-editing of articles (to prevent articles over-running the last page by a few lines), contributors are asked to note the undermentioned scale of words to a page.

	Words
1st Page with *single* line title	500
Full page of 44 lines of 14 words	550
2 Page article, therefore	1,050
3 Page „ „	1,600
4 Page „ „	2,150
5 Page „ „	2,700
6 Page „ „	3,250

Above allows for six separate paragraphs on each page.

Deduct for above totals: —

For double-line title	38
For *each* sub-heading	28

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1967
THE QUEEN'S AWARD TO INDUSTRY

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Ret.)

THIS year's White Paper on Defence* claims a £45 million "cut" in defence expenditure as compared with that of 1966 - 67. The estimate for 1967 - 68 is £2,205 m., while that for 1966 - 67 was £2,172 m. Converted to the equivalents of 1964 prices, these become £1,972 m. for 1966 - 67 and £1,927 m. for 1967 - 68 — a reduction of £45 million, as is claimed. This may seem like juggling with figures, but it is a fair comparison; and the claim is reinforced by the fact that defence expenditure in 1966-67 was 6.6 per cent of the gross national product, while the estimate for 1967-68 will be only 6.5 percent of the g.n.p. But whichever way you look at it, defence expenditure is still above the maximum of £2,000 million hopefully set by the present Government soon after they came into power. Yet we need not quarrel with that. Six or seven per cent of the g.n.p. is surely not too much to pay for security—if that is what our defence expenditure purchases—and we have too often been caught unprepared for an unavoidable war through parsimony in budgetting for defence.

Reduced Commitments

How can economy in defence expenditure be effected without jeopardising our future security? Last year's Defence Review aimed specifically at three things: (a) to bring defence expenditure into harmony with the nation's resources; (b) to adjust our military commitments so that they would be within the capacity of our existing forces; and (c) to reduce the charges payable in foreign currencies. Of these, the first appears to be in process of achievement; the second is well on the way to achievement; but the third must depend on the extent of our necessary commitments overseas and on our success in persuading Western Germany to contribute towards the cost of British forces under NATO command in Europe.

Last year, Mr. Christopher Mayhew rightly emphasised the facts that our forces were "overstretched" and that the only way to correct this without increasing them (which would have been politically impossible at the time) was to decrease our commitments. This is being done. But bringing home troops who are now stationed abroad does not in itself appreciably reduce defence expenditure (except sometimes in foreign currency); for these troops, with their families, still have to be housed and fed and of course paid. The only way substantially to reduce defence expenditure is to reduce the size of the armed forces; and this is what the Government, to its

* Statement on the Defence Estimates 1967 (H.M.S.O., 9s. 0d.)

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credit, is reluctant to do. Attempts to persuade the Federal Republic of Western Germany to make substantial contribution towards the cost of British forces now under NATO command in Europe, either directly or indirectly (by agreeing to purchase armaments manufactured in Britain), do not seem to be meeting with much success. Any reduction in the total manpower of our forces must inevitably fall most heavily on the Army, the future size and shape of which will depend on the size and shape of the British element in the NATO forces. And this is still under discussion. The Prime Minister has threatened to withdraw some portions of B.A.O.R.; but whether this is bluff or not we cannot say. If they were withdrawn, they would presumably be held in readiness in the U.K.; and the question would then arise, where would they be accommodated and trained?

The Royal Navy is still—and always will be—an essential part of our defence forces. The Defence Statement might have been expected to give some clue as to what would be the probable shape and size of the Fleet in the 1980's. But this it does not do. Instead it promises that the maritime strategy of NATO will be "revised" and that the Navy's probable needs in ships and weapon systems during the middle and late 1970's will be "extensively studied." (This we could surely have taken for granted, and it is high time that its needs for the 1980's were being considered.) It is, however, comforting to learn that "the carrier force will continue to be a component of the highest importance"—until the carriers become obsolescent or obsolete, for no replacements are contemplated.

Defence Review

When this Government came into office, we were promised a comprehensive and careful "Defence Review", which would first determine our necessary commitments at home and overseas and then assess the shape and size of the forces which would be necessary to fulfil those commitments. This we have never had. Instead we have defence estimates based on arbitrary figures of what we are supposed to be able to afford, with promises of reductions in our overseas commitments to prevent our forces being "overstretched". This is surely putting the cart before the horse; but that is politics.

Observing then this fashionable though illogical order of priorities, and having already discussed possible reductions in defence expenditure, let us now consider the purposes for which our defence forces will be required in the foreseeable future. The military situation in Europe seems to have become reasonably stable. The existence of NATO, equipped with tactical nuclear weapons and supported, in case of emergency, by the full nuclear potential of the United States, has so far succeeded in preventing aggression by the Soviet Union, which is itself now happily a diminishing danger. Soviet foreign policy has been modified of late for internal economic and social reasons; while the ever increasing hostility and nuclear potential of Communist China constitute a threat to the Soviet Union which makes them anxious to cultivate friends in the West.

In Malaysia, the ending of Sukarno's "confrontation" has made it possible to release most of the 10,000 army and air force personnel, who will probably have

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been brought back home this year. The policy of withdrawing our forces from Aden in 1968, when the South Arabian Federation becomes independent, still stands, regardless of its foreseeable effects, namely a sudden financial crisis in Aden itself, riots, bloodshed and the handing over of South Arabia to Nasser "on a plate." By way of compensation, it is proposed to make some small increase in the size of our forces in the Persian Gulf area; but who will be compensated thereby and what good this small addition will do is far from clear. British forces in Cyprus are being reduced and the Malta garrison withdrawn. But happily there is no suggestion, at present, of deserting Singapore and the Far East generally.

Career Stability in the Services

Meanwhile, according to the White Paper, the Government is concerned to settle the size and shape of our defence forces "in a way that will provide the maximum possible stability for the men and women who are making their career in the Services." This is an admirable intention; but does it not suggest that the armed forces exist primarily to provide careers for their members? Here again it looks as if the cart has got in front of the horse; or is it merely political clap-trap? While it is clearly desirable to make the Services attractive so as to ensure sufficient recruits, and while a stable career is the legitimate ambition of most respectable and ambitious men; are we not, by concentrating on this aspect of Service life, overlooking the fact that the prime function of our armed forces is to defend British interests in all parts of the world and to honour our obligations to other nations? This is hardly compatible with stability of careers, for political and military necessity may destroy such stability at any time and disrupt many planned careers.

New Command Structure

Each of the three Services is in future to have *one* operational command. That of the R.A.F. will be called "Strike, Reconnaissance and Defence Command." It will be formed by the amalgamation of Bomber and Fighter Commands; and its function will be to provide a military presence in any part of the world where British interests are threatened. The future of Coastal Command is still being considered. Transport Command will become "Transport and Ground Attack Command" and will include 38 Group. The Army's operational or strategic command will absorb Southern and Eastern Commands. In the Royal Navy, the Commander-in-Chief Home Fleet at Devonport will also be responsible for all R.N. activities east of Suez, while the Commander-in-Chief Portsmouth will be mainly responsible for shore arrangements and administration.

Married Families Returning

According to the White Paper, some 25,000 Service men and 6,000 families will have returned to Britain from outside Europe by April, 1968. This will create no mean housing problem, but it is already being taken care of. Nearly 4,000 houses will be bought by the Government and these will accommodate most of the married families, the rest are to be housed in "hirings" or in "mobile homes" (*i.e.* caravans). For unmarried Service men who cannot be accommodated in existing barracks, it is

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proposed to re-condition 16 disused barracks, if the necessity arises; but this will depend, as does so much else, on the outcome of the discussions on the future strength of NATO. In the debate on 27th February, Mr. Healey (Defence Secretary) revealed that the Government also intended to build 20,000 new married quarters for the Services during the next three years.

Besides the 25,000 men mentioned above, about 10,000 more are expected to return from the Far East within the next two years, owing to the planned reductions in our bases in Malaysia and Singapore; though, as we saw above, there is no suggestion of their being closed down altogether. Mr. George Brown (Foreign Secretary) told the House of Commons on 1st March that the families of Service men now in Aden were being brought home and will all be out by the end of July this year (1967). Mr. Denis Healey (Defence Secretary) hopes to visit Aden later this year.

Debates in Parliament

The Government's proposals for expenditure on defence in 1967 - 68 were debated in the House of Commons on 27th and 28th February (*see* Hansard). The Secretary of State for Defence (Mr. Denis Healey) opened the debate and spoke for one hour.

Perhaps the most important of Mr. Healey's remarks were those concerning the military situation in Europe. "Soviet policy towards Western Europe," he said, "has changed fundamentally since NATO was set up." There was now a political *détente*. China had emerged as a potential threat on Russia's eastern frontiers . . . If foreign exchange remained a major problem, Britain, and perhaps the United States too, might consider keeping some of their NATO ground forces at home in normal times, provided they were available to NATO in a crisis . . . If war were to break out on the Continent, NATO would be compelled to use nuclear weapons within days, and Russia would be using them from the word go. In these circumstances, the war could not last long . . . And if the only danger of war in Europe was by miscalculation or accident, such a conflict could hardly involve more than a battalion or two on each side; because miscalculation or accident was practically impossible at higher levels.

The second day's debate was even more disappointing than the first. Towards the end, however, Mr. Denis Healey did make a few interesting statements about the Anglo-French variable geometry aircraft (AFVG), the F.111 and the future of the V-bombers. The AFVG, he said, was the core of the long-term programme. It would succeed the Canberra and the V-bombers, complementary to the F.111.K, in the middle seventies. Its role, like that of the TSR.2, would be mainly reconnaissance; and its range would be enormous, which might well be fully exploited in the maritime role. The AFVG and the F.111.K2 were not intended only for use east of Suez, they would be useful anywhere in the world. The long-lasting and versatile V-bombers, he added, would be perfectly adequate for coping with less well defended targets up to about 1975, (This was received sceptically by the opposition).

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THE DECLINE OF THE LAND OF UCK

By Squadron Leader R. P. Saundby, M.B., Ch.B.

The following records a dream experienced, while flying as a passenger in a 70 Squadron Hastings between Akrotiri and Muharraq, after reading — "SPACE PROJECT PRIORITIES FOR BRITAIN" (The Gordon Shephard Prize Essay, 1966) — published in the Spring number of the R.A.F. Quarterly.

SMOKE swirled round the dark cave. At the far end, dimly discernable through the gloom, sat a shrunken old man. By his side was a small earthenware dish containing a few pieces of glowing charcoal. The old man was almost naked except for a few skins and round his neck hung a string of handsome glass beads, glinting fiery red in the light of the embers. The beads were the pride and principal export of the tribe of Uck, of which the aged man was the oldest warrior.

There was a noise at the entrance of the cave and the old man reached for his spear, but recognising the three young men who entered he laid his spear down. The three young men were armed and on their shields were enscribed their names, Modnav, Modarm and Modair. These three young men were the warriors to whom the tribe of Uck had deputed the guarding of the tribal lands. The young men laid their arms on the ground and it could be observed that their swords and spears, while sharp and well cared for, were old and worn.

"Young men" said the old man, his voice booming round the cave, "to what do I owe the honour of this visit, that you warriors should seek the company of an old warrior in his declining years? Did you ever solve the mysteries of the great fireball, devised at the end of the last war, which can destroy a whole area in a single flash, and against which only the deepest cave provides protection?" One of the young men spoke, "Old man, we have a few of these fireballs ready for use, but they are few, and other distant lands each have many fireballs. You will remember, many harvests ago, we concluded our agreement with the land of Ussah and several other small tribes, to combine against the land of Ussar but we still fear that if the lands of Usah and Ussar do battle we will be burnt by the fireballs of both."

The old man nodded sadly and then, looking up, said "Pray continue and tell me the nature of your business." The three young men settled themselves comfortably on the floor of the cave and the second one began to speak. "You will know, respected sire, the situation of our land. We are a small island situated on the edge of a great ocean. All other lands are also situated along the coast. Several days journey towards the dawn lies the land and people of Ussar. Since your early youth this land has been ruled by priests, also they have many soothsayers and astrologers but these are kept hidden so little is known of their powers. The land of Ussar is very large and the people are numerous, but the earth is not everywhere rich. Several

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proposed to re-condition 16 disused barracks, if the necessity arises; but this will depend, as does so much else, on the outcome of the discussions on the future strength of NATO. In the debate on 27th February, Mr. Healey (Defence Secretary) revealed that the Government also intended to build 20,000 new married quarters for the Services during the next three years.

Besides the 25,000 men mentioned above, about 10,000 more are expected to return from the Far East within the next two years, owing to the planned reductions in our bases in Malaysia and Singapore; though, as we saw above, there is no suggestion of their being closed down altogether. Mr. George Brown (Foreign Secretary) told the House of Commons on 1st March that the families of Service men now in Aden were being brought home and will all be out by the end of July this year (1967). Mr. Denis Healey (Defence Secretary) hopes to visit Aden later this year.

Debates in Parliament

The Government's proposals for expenditure on defence in 1967 - 68 were debated in the House of Commons on 27th and 28th February (*see* Hansard). The Secretary of State for Defence (Mr. Denis Healey) opened the debate and spoke for one hour.

Perhaps the most important of Mr. Healey's remarks were those concerning the military situation in Europe. "Soviet policy towards Western Europe," he said, "has changed fundamentally since NATO was set up." There was now a political *détente*. China had emerged as a potential threat on Russia's eastern frontiers . . . If foreign exchange remained a major problem, Britain, and perhaps the United States too, might consider keeping some of their NATO ground forces at home in normal times, provided they were available to NATO in a crisis . . . If war were to break out on the Continent, NATO would be compelled to use nuclear weapons within days, and Russia would be using them from the word go. In these circumstances, the war could not last long . . . And if the only danger of war in Europe was by miscalculation or accident, such a conflict could hardly involve more than a battalion or two on each side; because miscalculation or accident was practically impossible at higher levels.

The second day's debate was even more disappointing than the first. Towards the end, however, Mr. Denis Healey did make a few interesting statements about the Anglo-French variable geometry aircraft (AFVG), the F.111 and the future of the V-bombers. The AFVG, he said, was the core of the long-term programme. It would succeed the Canberra and the V-bombers, complementary to the F.111.K, in the middle seventies. Its role, like that of the TSR.2, would be mainly reconnaissance; and its range would be enormous, which might well be fully exploited in the maritime role. The AFVG and the F.111.K2 were not intended only for use east of Suez, they would be useful anywhere in the world. The long-lasting and versatile V-bombers, he added, would be perfectly adequate for coping with less well defended targets up to about 1975, (This was received sceptically by the opposition).

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THE DECLINE OF THE LAND OF UCK

By Squadron Leader R. P. Saundby, M.B., Ch.B.

The following records a dream experienced, while flying as a passenger in a 70 Squadron Hastings between Akrotiri and Muharraq, after reading — "SPACE PROJECT PRIORITIES FOR BRITAIN" (The Gordon Shephard Prize Essay, 1966) — published in the Spring number of the R.A.F. Quarterly.

SMOKE swirled round the dark cave. At the far end, dimly discernable through the gloom, sat a shrunken old man. By his side was a small earthenware dish containing a few pieces of glowing charcoal. The old man was almost naked except for a few skins and round his neck hung a string of handsome glass beads, glinting fiery red in the light of the embers. The beads were the pride and principal export of the tribe of Uck, of which the aged man was the oldest warrior.

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days journey to the setting sun lies the land of Usah, also a large and populous land, but well wooded and fertile, truly a land on which the gods smile. Fortunately, the people of this land have been of good heart towards us. When we have been pressed by enemies they have sold us weapons, but they never gave us the great fireballs which are not allowed out of their sight."

The old man spat on the floor, kicked a bone aside and said, "I know all this, you have not come to tell me this, what is new in the land?" The third young man spoke up, saying "Sire, the riddle is not what is new in the land but what is new outside the land. You know well that all lands border the ocean, that the water adjoining the land is calm and smooth, that a short distance out is a reef and beyond the reef the water is deep and rough; there all forms of land life die. You will know all this because in your youth you were one of the first to swim in the sheltered shallow waters inside the reef. The art of swimming is now well perfected and by clever use of currents, swimmers are now able to travel rapidly between different places and even carry with them a few possessions."

The old warrior spat twice more on the floor and said testily, "Yes I know all this, when young I was one of the first to use the art of swimming for war. In the war of my youth we developed this art so as to dominate the older arts of war, verily we dominated the world itself; but you must stop an old man rambling, tell me your present trouble."

The first young man spoke up again in a subdued voice. "Both the lands of Ussar and Usah have built craft which can cross the reef and remain afloat on the open sea. At present these craft are small and most are unable to return across the reef." "Can these craft swim inside the reef?" asked the old man. "No" replied the young man, "For the current would dash them on to the shore and they would be destroyed."

The old man sucked his last remaining tooth in a reflective manner, added some more charcoal to the dying embers and said "Tell me more of these craft, how are they constructed and navigated, and what benefits have fallen to those who despatch these craft across the reef?" Modair replied, "These craft are very costly, sire, more so than if they had been built of solid gold. Craft have been navigated into the great ocean from both the lands of Usah and Ussar, indeed there is a great ambition between these two lands. Much knowledge has accrued to these great lands from the voyages of these craft. Our friends in Usah have appraised us of much of this but we know not what they keep to themselves. Also our astrologers have gained some crumbs of wisdom by directly observing these craft."

The old man turned to the young men and said "Why does not the land of Uck build a great fleet of these craft and recover the glories that we possessed before the war of my youth?" "Alas," said the young men in unison "would that we could." Modarm continued, "You will be aware that for many generations the people of Uck have supported themselves by manufacturing beads, pots and small tools. These we have bartered for food and other desirable, but less essential goods. Over the years these trades have flourished, now our caves are well appointed and our women beautifully adorned. These new craft are costly beyond belief and our people would

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never sacrifice their delights for the building of a fleet. Our problem is how to maintain the past great stature of our tribe." "It is late," said the old man, "And my bones grow cold, I fain must sleep. Come again the morrow's even and I will tell you the answer to your question."

As the last rays of the setting sun lit the entrance of the cave the young men gathered outside. Their bodies were tired but their minds were alert for they had spent the day in military exercises. As the dusk gathered they watched the craft of Usah and Ussar, glinting as they tumbled in the dusk. Inside, the three young men saluted the old man. Before sitting down they gave the old man a jar of fiery spirit, provided for the occasion by Doff Vict, a factor of Modnav. When they had settled themselves the old man drank a generous draught of the spirit and stated, "Young warriors, I have considered your problem and there is no easy solution. These craft are costly beyond belief, and to build a fleet would beggar our people. Even if we beggared our people it would profit us little because we would remain third in the race. It profits a man little to be third in a race at great cost if he can only be third. We have already combined with neighbouring tribes on some minor enterprises. Such combination provide for greater strength but I am unsure that in our hearts we are all truly willing to combine." The old man took another drink of the spirit and continued, saying, "I have asked others to attend here tonight. They have agreed to meet here, out of respect for my old bones. Of great import is the keeper of the tribal money bags, who is attending in person. With him are his advisors, a scribe called Hereford, who has long studied the arms of Usah, and others, some of alien tribes who are wizards in the manipulation of money."

The four warriors passed the spirit around for the last time and then the old man said "Modnav, hide the spirit behind your shield, I would fain it were not seen by the keeper of the money bags." The young men nodded, for they had great difficulty in keeping many things from him, in truth they were more afeared of his spies than the spies of the enemy.

There was a noise at the entrance and several soberly dressed middle aged men came in. The keeper of the money bags was easily recognised by his thin, ascetic appearance. He sat down in the warmest place, just in front of the fire, and his advisors arranged themselves behind him, their only part in the moot was to be an occasional whisper in their leader's ear.

The old man kicked the embers and said to the new arrivals "You know of what we talk." The keeper of the money bags nodded, saying "I always know all of what you talk. You have been talking of these new craft which can swim in the great ocean." The old man nodded, and the keeper continued "I and my advisors have made a great study of these craft. From the day when the first man burst from the womb of God man has been driven to extend his frontiers of geography and knowledge. Even I am excited by the race between the lands of Usah and Ussar. But, Gentlemen, I am charged with the tribal gold and my advisors have told me that if we wait we will gain all this knowledge at small expense. The craft are costly, more so than if they were built of solid gold; small craft, such as we could build, are yet more costly still. Any expenditure on these craft must be studied most closely."

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The keeper of the money bags whispered with his advisors and then continued, "My advisors tell me that the expenditure on these craft in the land of Usah is even a burden on that great land, and their adventures are so great that almost no seas are to be left unexplored. These new craft can be used as heralds to bear tidings between men. When used as heralds, with suitable dues being paid, they could bring much profit. If we could persuade our many neighbouring tribes to provide gold, I would be prepared to advance part of the cost of constructing such craft, in the expectation of later rewards.

As for great explorations, of tradition these have been oft led by warriors. I would advise you to join with your friends, the warriors of Usah, and make adventure in their craft called Apollo."

They all sat silent for a while and the fire slowly died down, until not a spark was left and the cave was in darkness. The visitors left silently and the three young men gathered their weapons. As the three filed out of the cave one whispered to another "How does your wife like you being out so late?"

ROYAL FLYING CORPS MEMORIAL

In August, 1914, Numbers 2, 3, 4, and 5 Squadrons were the first to fly to France; they took off from a now-disused airfield, known as R.A.F. Swingate. Many who still remember those crucial and formative days, and others who wish to honour these memories decided to erect a memorial there.

It is ¼ mile east of Dover Castle on the coast road to St. Margaret's Bay, and 400 yards from the R.A.F. W/T Station, Swingate. (There is a notice on the coast road, and another under the notice of the Defence Area.) The easiest approach is from the entrance opposite the Duke of York's School gate, and along the narrow gravel road from the R.A.F. Station; parking space is available. The Memorial was completed just before July 17th, 1966, the birthday of Marshal of the R.A.F. Sir John Salmond who was in command of No. 3 Squadron in those days. The Dover and Deal Branch of the R.A.F. Association have most kindly undertaken to maintain it.

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Hartop's Hat Trick

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Ret.)

EARLY in April, 1945, the war in the Mediterranean theatre was drawing to its close. Our forces had broken through the Gothic Line in Italy; and the British Eighth Army were advancing towards Venice; while the Americans were heading for Milan and Turin.

The Germans, who had occupied the Balkan peninsula since April, 1941, were now in full retreat through the mountains of Slavonia, harried and chivvied on their way by the Yugoslav Partisan Army of Josep Broz, better known to us as Marshal Tito. This guerrilla force of nearly a quarter of a million patriots had, for nearly twelve months, kept all the German and Bulgarian divisions in the peninsula fully occupied. They had been supported in this admirable work by British and American air force units operating from bases on the east coast of Italy, moving northwards as our troops advanced. This support usually entailed a double crossing of the Adriatic — about a hundred miles of open sea each way. To pilots flying single-engined aircraft, this constituted a hazard which they naturally took in their stride; but there were times when the hazard became a serious reality.

Among the pilots engaged in the aforesaid sorties across the Adriatic Sea was one Robert Hartop, a young Lieutenant of the South African Air Force, who was then serving with No. 200 Squadron of the Desert Air Force. ("Hartop" was not his real name; but, being unable to trace him and get his permission to write this true story, I am bound to give him a pseudonym.) He, like many of his patriotic countrymen, had come from his distant home in the Union (now the Republic) of South Africa, to help Britain and her other Allies in the very necessary task of defeating Hitler. In the course of his duties on that fine April morning, he was to fly as No. 2 in a formation of single-engined fighter aircraft engaged in an armed reconnaissance of the Maribor-Graz area in the extreme north of Yugoslavia and almost on the borders of Austria.

Lieutenant Hartop, it appears, awoke rather later than he had intended on this occasion; and, after swallowing a cup of hot tea brought by his batman, he hastily donned his flying kit over his pyjamas — to save time. Usually this would not have mattered; for he could normally count on an opportunity to rectify his sartorial irregularity on returning to his Mess after the sortie. Unfortunately things do not always work out as expected.

The take-off from the base at Cervia, on the east coast of northern Italy, was uneventful — there was, of course, no reason why it should have been otherwise —

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and the formation set course 45 degrees, which took them across the Adriatic Sea in the direction of their first objective. The weather was perfect — perfect, that is, from a holiday-maker's point of view. The sea was calm and a deep Mediterranean blue, and the only clouds were a few wisps of alto-cumulus such as one usually sees over the Adriatic on a fine day in spring. The Apennines on the port quarter and the Balkan mountains on the starboard bow were magnificent in their rugged grandeur, a symphony of grey and green. The pilots could just discern the little clusters of square white blocks, which were the coastal towns on either shore. It would have been an altogether delightful scene if there had been no war on. As it was, the pilots could have done with more cloud in which to take cover if necessary. They flew high when crossing the coast of Istria; but they had to descend when over their objectives in order to ensure good photographs of the area to be reconnoitred. Fortunately there were no enemy fighters to dispute their right to be where they were, but enemy *flak* gave them some trouble at times. The aircraft shuddered every time the shells burst near them, and fragments could be heard hitting the fuselage. But the formation flew on, apparently unscathed, and completed their photographic "runs" without loss. They then turned for home, with some satisfaction and much relief; for a forced landing in Yugoslavia might have meant capture and possibly disablement as well, but certainly the loss of aircraft and photographs.

Soon after they had re-crossed the coastline and were flying south-west over the sea, Hartop's engine began to falter; and it very soon petered out altogether. He looked quickly at the fuel gauge, but found it registered "quarter full." He then looked at the oil-pressure gauge and found that too was normal. Yet the engine had stopped, and its behaviour suggested nothing less than seizing-up. He then rightly concluded that his cooling system had been hit by *flak* and that he had lost all his "glycol." He at once reported to his leader and put his aircraft into a gentle glide, heading due south. He could, of course, have glided to land on either side of the Adriatic because he had sufficient height; but he knew that to do so would be to risk falling into enemy hands. It was almost literally "the Devil or the deep blue sea", and he chose the latter. One other aircraft of the formation peeled-off, under the commander's orders, and cruised around to protect the "ditched" pilot and to indicate his whereabouts; while the remainder flew on back to base.

After losing some height, Hartop decided to bale-out; and he soon found himself floating gently down towards the sea near the Istrian peninsula, with the white billowing canopy of his parachute above him. When approaching sea-level he dropped a shoe into the water to judge his height; and then, striking the release button of his harness just at the right moment, he made a perfect landing on the water. He quickly inflated the collapsible rubber dinghy with which he was provided and was soon seated in it and floating calmly on the smooth water, enjoying the peace and the view but longing for a smoke.

Meanwhile the formation had signalled the Air/Sea Rescue Service; and Hartop's escort, having watched him down to the surface of the sea, departed to guide them to the spot. Very soon a Walrus arrived on the scene, but it did not touch-down because the sea was known to be mined thereabouts. Robert, however, was happily unaware

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of this; for it would certainly have spoilt his enjoyment had he known. When it was time for the Walrus to go home, two Spitfires took over and stayed for a time. They were relieved by two Mustangs, which remained until a Warwick arrived with an airborne lifeboat. This was dropped near the dinghy. Hartop paddled himself to the lifeboat and clambered aboard. The first thing he noticed in it was a piece of paper pinned to one of the thwarts. On it was written this encouraging message: "Steer course out to sea, Walrus will pick you up. Mines suspected here." Now for the first time Hartop was worried. With flying and all the hazards of the air he was perfectly familiar; but with sea-mines he had never had to do, nor did he want to.

The airborne lifeboat had twin motors. Robert easily got the starboard motor going; but when he turned his attention to the other one, do what he could it would not start. Probably the ignition leads had become soaked with sea-water and the current was leaking to "earth." The leads would have to be thoroughly dried out. He throttled down the starboard motor and, by keeping the tiller half over to port, succeeded in keeping a fairly straight course away from the land. He could easily turn to port simply by bringing the tiller amidships, when the starboard propeller would quickly bring the boat's head round; but if he wanted to turn even a point or two to starboard, he had to throttle down the one good engine and put the tiller hard over to port.

While he was performing these delicate manoeuvres, an enemy Air/Sea Rescue launch appeared, coming from the naval base at Pola, in Istria. It was obviously intent on effecting both a rescue and a capture at the same time. But every time it approached the erratically moving lifeboat, the Warwick sprayed it with machine-gun bullets; and after a little of that, its captain wisely decided that the capture of one ditched airman was not worth risking his launch and the lives of his crew for, so he retired tactfully at full speed. Soon after the departure of this unwelcome intruder, a Catalina flew over, alighted near the lifeboat, and picked Hartop up.

Much to the surprise and delight of the crew of the flying-boat, the rescued airman was found to be wearing a very natty suit of maroon coloured pyjamas, which added even more colour to an already colourful scene. The reason for this unusual wear we have already noted. When Robert dropped into the sea, his clothing naturally got soaked; so he had discarded all but his pyjamas, which were quickly dried on him by the warmth of the sun. After all, a suit of silk pyjamas — of any colour, and the brighter the better — is a very appropriate costume for wearing in a lifeboat on the Adriatic Sea on a warm sunny morning in April.

Happily our amphibious friend suffered no ill effects from his enforced parachute descent and subsequent immersion. Within three days after this episode, he was again flying on another reconnaissance sortie. This time the objective was Ljubljana.

"Fortune," they say, "is a fickle jade." Certainly she distributes her favours unevenly. And this goes for misfortune as well as good fortune. Some people have all the luck, others the ill-luck. Lieutenant Hartop was one of those; but which of those depends upon the point of view.

For, on the way back from the Ljubljana reconnaissance, exactly the same things

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happened to him all over again. Again his aircraft was hit by *flak*, again all his glycol streamed away, again his engine stopped, and again he glided down to the very inviting sea. As before, one of his fellow pilots stayed with him as escort; as before, he baled-out over the sea; and as before, he dropped a shoe into the water to test his height, alighted safely on the blue and shining surface of the Adriatic, inflated his rubber dinghy and climbed into it. This time he found himself floating serenely near Trieste — much too near, in fact, for his peace of mind. He could hardly see the city because it was shrouded in early morning mist; but the enemy must have seen his parachute descending, for they immediately sent out two rescue boats to capture him. The escort aircraft, however, drove them off with gunfire and rockets.

Meanwhile Robert Hartop was making himself as comfortable as he could in his very small dinghy, enjoying the scenery and the discomfiture of his would-be captors. But the enemy were more persistent this time than they had been on the previous occasion. They sent out a third motor-launch, which refused to heave-to on receipt of a signal from the escort aircraft backed by token gunfire. This launch was sunk. Soon a Catalina arrived on the scene and circled overhead, but it would not alight on the water because of the minefield — just as before. Then a Warwick arrived and dropped a lifeboat, suspended from six parachutes. Hartop lost no time in getting aboard this vessel. By this time, it may be assumed, he was familiar with the drill; and he soon had both engines running. This was particularly fortunate because the enemy now opened fire on him with 40 mm. cannon from the shore, the morning sea-mist having been dissipated by the sun, which was now well over the Dalmatian mountain-tops. Robert, as before, made for the open sea. By night-fall, however, he was still in the minefield; so he stopped the engines and settled down for the night. This time he was more adequately clothed.

At first light next morning, the Catalina appeared again with an escort of two Mustangs. She signalled: "Steer 200 degrees. We'll pick you up some time. Still mines." Hartop set the appointed course; but the luck he had hitherto enjoyed seemed to be changing. Calm turned to storm, the wind freshened from the North bringing intermittent showers of rain, and the sea rose in lumpy waves. Then, to make matters worse, one of the lifeboat's motors petered out and would not start again. In spite of the storm, however, the Catalina took a calculated risk and touched-down near by; and one of its crew boarded the lifeboat with a line. Robert was soon aboard the Catalina and drinking hot coffee laced with rum. The captain greeted him warmly. "Haven't we seen you somewhere before?" he enquired dryly.

For this, and for previous gallant services, Lieutenant Robert Hartop was awarded the Distinguished Flying Cross; and after a medical check-up and a spot of local leave he returned to duty. But the fickle goddess was not yet done with him. To her usual attribute must surely be added that of a peculiar sense of humour — or at least a fondness for harmless mischief. April would seem to be Robert's unlucky month; for, on the very last day of it, he was again the victim of circumstances.

His flight, on this occasion, was engaged in attacking enemy road transport

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beyond Udine, which lies north-west of Trieste; and on the return trip his aircraft was for the third time hit by anti-aircraft gunfire. This time it was not glycol that streamed out of his aircraft but lubricating oil. The effect, however, was much the same. The engine showed signs of over-heating; and before it actually seized-up, he switched off and began to glide down towards the sea. At 7,000 feet he jumped; but in his haste he failed to clear the tail-plane, which struck him a severe blow on the arm in passing. As twice before, he reached the surface of the sea in a minefield; but this time he was about five miles from the coast at Lignano — another awkward situation in view of the enemy's presence in Istria. Again as before, an escort (of two aircraft this time) remained within sight of Robert's dinghy until the now familiar Warwick appeared; but as the weather suddenly turned very bad, all the aircraft had to leave the neighbourhood and return to base. Hartop was quite alone. This was no joke, but at least he was free from enemy interference. By nightfall the storm subsided; but the sea remained rough, and he had to spend most of the night baling out his dinghy.

Towards dawn, he fired red Verey lights to give his rescuers some idea of his position; and at daybreak, three friendly aircraft arrived: a Catalina, a Mustang and a Flying Fortress. The Flying Fortress succeeded, after two abortive attempts, in dropping a lifeboat, much to Robert's relief. He scrambled aboard but was immediately confronted with another, and an unexpected, problem. The lifeboat was an American one, of a type he had never seen before, and the engines were unfamiliar to him. But, as the reader will have already realized, our friend was a man of resource; and he soon discovered how to get the engines started.

He then set course southwards, lashed the tiller amidships, and settled down to an American breakfast of pork and beef paste, sweet biscuits, peanuts and candy; after which he enjoyed the excellent Virginia cigarettes, thoughtfully provided by our American Allies for just such an occasion. Once again, the day being gloriously fine, Hartop began to enjoy the peaceful beauty of the scene, particularly as no enemy boats appeared; and he reflected, somewhat inconsequentially, that it was May Day. His aerial escort stayed around until 1115 hours, at which time he was duly recovered, lifeboat and all, by a high-speed Air/Sea Rescue launch. Safely on board the launch, he was offered rum which, for some unaccountable reason, he refused; but he was persuaded to partake of a little chicken soup and some bully-beef sandwiches.

In his squadron Mess at Cervia that evening, Lieutenant Robert Hartop, D.F.C., S.A.A.F., was given an ovation for his "hat trick" and invited to enter his exploits in the "Line Book." This he did, and his entry was there and then verified by his squadron commander and later by the captains of the Catalina and of the rescue launch. But a still greater honour awaited him. Before going to bed that night, he received a personal signal from the Air Officer Commanding the Desert Air Force, to which (it will be remembered) he belonged. The signal read as follows: "PERSONAL FROM A.V.M. TO HARTOP STOP HAVE APPOINTED YOU HONORARY COMMODORE DESERT AIR FORCE YACHTING CLUB STOP WHEN FORMED."

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THE AIR LEAGUE

THERE are three good reasons why everyone who participates in British aviation — in the Services, in the airlines, in the aircraft industry or in club flying — should join the Air League. The first is that the League is a body which exists solely to promote and support all aspects of British aviation, which means that it aims to see a strong Royal Air Force and Fleet Air Arm, prosperous airlines, a stable and efficient aircraft and aero-engine manufacturing industry, and a well-supported light aviation movement. The second reason is that the League can speak up for all the aspects of aviation as it is a non-commercial, non-political body. The third is its record over more than 50 years of supporting British aviation.

The Air League carries out its work through all the modern communication and influential media of modern society — Parliament, the Press, radio and television. One of its most recent successes was the campaign it waged in favour of the continuance of the Concord supersonic airliner project. The Air League also fought hard for the TSR2, though the campaign to save that project was not successful.

It is clear that the work which the Air League does as the main propaganda authority in British aviation is of value ultimately to every individual concerned, whether he be a pilot, an employee in the aircraft industry, an aviation enthusiast airborne at weekends, or a school boy or girl learning to fly. This work is carried out by various means. The Air League sponsors articles and letters in newspapers; it keeps in close touch with members of Parliament interested in aviation; it is ready to supply them with information when required and promotes the putting-down of Parliamentary questions on important topics; it has formed a panel of TV and broadcasting speakers, made up of men with first-class knowledge of their own branch of aviation; and as a practical means of fostering air-mindedness, it is setting-up Junior Members Flying Groups to enable boys and girls to learn to fly at a nominal cost.

The League has been responsible in past years for many important developments in UK aviation. Before the First World War, it awakened this country to the need for aviation development which should match the progress being made in France and the United States. After the war, it fought hard to maintain the independence of the Royal Air Force. It insisted upon the entry of Great Britain into the Schneider Trophy Contest. The League inaugurated the Air Cadet Corps, which became the Air Training Corps and supplied the Royal Air Force with thousands of aircrew during the Second World War. After the war, the League campaigned for a vigorous Civil Air Transport policy, opposed monopoly and advocated a supersonic airliner.

To carry out its work, the League depends upon an income derived from subscriptions and donations, profits from its magazine *Air Pictorial* and from the annual Air Ball. But it is in the number of individual members that the real strength of the League must reside. Annual subscription is only £2 and this includes 12 issues of *Air Pictorial* and all other Air League publications. Less than 1/- a week is a small price to pay for a voice in an organisation which speaks up for every aspect of British aviation.

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CHITTENDEN'S DOG

By Peter Holmes

Peter Holmes served in the Oxford University Air Squadron and No. 61 Squadron. He was a Prisoner of War in Stalag Luft III — 1942 - 1945. He now writes as a facts article research man and enjoyed writing this flying story as a change.—A.H.S.

MUCH depended on how you looked at Chittenden's dog, Kaloo — and who was doing the looking. No two opinions in the 'Black Boy', each given in good faith, ever matched about him. Some saw him as a sort of mixed-up Afghan hound, others as part Airedale; some just said he was a menace; then slipped their almost empty pints down on to the floor for Kaloo to finish off — lap, lap, lap . . .

Now I can see quite clearly that Kaloo did many things for me — I only wish he hadn't. I can now see that it was Kaloo that got me commissioned when I should have been far better employed and, perhaps, far happier, as an everyday sort of airman. As it turned out Kaloo's doing was my undoing.

At that time, in the clear-eyed simplicity of my early years, my advancement in the Air Force seemed, at least to me, natural enough. Why when my promotion to higher office was announced it should have caused so much brouhaha round the aerodrome was beyond me. I was completely taken aback at the jet-like sucking in of breath when my name was listed for commissioning.

I assumed, quite naturally, that the clear insight of the AIR COMMODORE, who judged whether we should become sergeant-pilots or officer-pilots, had seen in me something which perhaps, in those days, was not immediately clear to others.

Moreover, at the time of the incident, I was still a saucer-eyed simpleton, gazing at the world's wickedness: I still believed, for instance, that the name Marlborough only echoed round the Marlborough Arms in town, or, in more learned circles, was the name of the famous admiral who sank the American fleet off the Ushant in 1812 all at one go.

But judge for yourselves . . .

The facts are that, at the time of this commissioning incident we were all busy in the Navigation Hut, filling in our personal history forms. It was the first afternoon of our being on the aerodrome of 22B Flight Training School.

Chittenden was marching (he never walked, strolled or lounged) up and down between the tables in what we Service people used to call—(please pardon the blunt Air Force expression—now fortunately obsolete)—a bloody-minded manner.

He had lapsed into this—er—bloodiness, after reading to us, his assembled cadets, the Air Ministry's Monthly Flying Report.

He had read it as an awful warning to us all, for in it was printed the story of an unfortunate cadet who, some weeks earlier at an Elementary Flying School, had foolishly swung over by hand the propeller of a Tiger Moth, with the throttle left

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fully open. The plane had taken off, pilotless, and after some violet corkscrews, which the author vividly described, plunged, still pilotless, into the depths of the River Humber. It was the kind of daily disaster anyone could have committed in the enthusiasm of the moment.

But Chittenden's mouth had thumbed-down at the corners as he read.

"If any cadet of mine ever . . ." he added, looking slowly from face to face with hooded eyes, lidded like a viper's, "If any cadet of mine ever . . ."

With wide eyes I listened to the report attentively but some of the others distracted Chittenden as he continued to read, by smirking, even grinning, and giving under-eyed glances in my direction.

Chittenden's eyes had followed their glances until he was staring unbelievingly into my face. Hence his present blo—, bad-tempered look, and the dark brooding in his face.

I should have liked to have been frank and pointed out to him one or two things about that report as it was not altogether correct: for example, the bit about when the cadet flung himself to the ground was a sheer, dramatic mis-statement. In reality I tripped over a chock I'd forgotten to put under the wheels.

Moreover I fell flat into some oil-sludge which stuck to my sleeve for days, and the report didn't even mention a word of this.

Instead of explaining these points to Chittenden I got on with the immediate task of filling in my commissioning form, keeping my head down close to the table. By squinting sideways, while keeping my head looking straight at the form, I could get a knot-hole view across the boundless aerodrome to the blue sky beyond.

I was just getting down to filling in the line about my old school in Hackney—Marlborough Street Council School—and I had just got the first word down when the sunlight went out of my knot-hole. Switched off. The sunlight had gone and in its place were the rough coconut whiskers of Kaloo's belly.

He was standing up at the window with his fore-paws on the glass. His eyes were on me—speculatively—summing me up. He cocked his head a bit on one side and blinked.

I winked at him. He blinked once or twice, rolled his eyes upward and started dribbling, with his tongue dangling out.

To keep him entertained I wiggled my pen through the knot-hole. And the next moment he was bounding away across the aerodrome with my pen in his mouth, leaping away into the boundless distance like an unsprung kangaroo.

I was still frowningly absorbed in mind-willing him back when Chittenden snatched my form away, stuffed it under the others, and sent it off to the Air Commodore.

My interview with the Air Commodore was the shortest on record.

"Remember Wanstead?" he shot at me with a sly glance as I stood rigidly regimental in front of him, "Remember old Wanstead?"

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How could I be expected to forget Old Wanstead and the fights we had round Wanstead Flats when we were boys? How could I ever be expected to forget our fights with Ginger Annis' gang—and the winter night when Ginger's sky-rocket scorched up my trouser leg?

Bitter pleasure; bitter pleasure! I smiled.

A smile fluttered at the corner of the Air Commodore's mouth, his lower lip began to quiver; then he could hold himself in no longer and he burst out into buffets of laughter. The guffaws guffed out of him in generous gallumphetings.

He got up from his seat, came round from behind his desk, smote me on my narrow back, and exclaimed, "You'll do!"

And there I was back in the corridor with the others clustered round me asking in hurried whispers, "Did he ask you anything about the Course-Setting Bomb Sight?"

Surprise, surprise! Was I surprised when I found myself lurching brazenly into the Officers' Mess!

The only uncomfortable thing I found about my new status was that I was flung more closely into Chittenden's arms, as it were. He lived in and ruled the Mess, having moved in and conquered it years ago when it was first built. Some said it had been built around him. Nevertheless all went well until the AIR MINISTER decided to pay our Training School a visit.

For his visit we worked non-stop for eleven days, working feverishly (when Chittenden was around), making the School immaculate for the IMPORTANT VISIT. We even had new chains fitted in the Mess cloakroom (This is fact!) and as Chittenden had put me in charge of the cloakroom I took a pride for eleven days in seeing that everything was dangling in good order.

On the morning of the visit I was confined to my cloakroom. Kaloo, as was his habit, was looking in through one of the top windows to see where I'd got to. He had the disconcerting habit of looking in each top window until he found where I was reading the paper. I was just explaining to him that it was no good fussing, and that we were confined to cloakrooms until the visit was over, when one of the new chains swung off loose in my hand—came away quite loose and swung dangling from my fingers.

As Chittenden had issued one of his strict orders, that any defect must be immediately reported, I set off immediately with the chain dangling from my hand in search of Chittenden.

We met on the main staircase. I was climbing upward while the Air Minister, the Air Commodore, and Chittenden in creepy attendance, came downstairs. But I knew my drill.

As they approached looking vaguely surprised at the chain in my hand, I stepped discreetly aside and flung up the most swinging salute of my career—and the chain wrapped itself round my neck like a python.

Chittenden rushed to my rescue but his wrenching at the chain only seemed to

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tighten it. But the Air Minister (Bless him!) proved himself to be a wonderfully charming, sympathetic, affable sort of man but Chittenden, a man of lesser humanity, always let this trivial chain incident jangle in his memory.

Without doubt it was this lack of understanding on Chittenden's part that caused my career in the Air Force to be only a part-success. I'm sure, for instance, I've never made any claim to expert airmanship akin to that of Cheshire, or Bader, or Stanford Tuck's. I suppose I was just the ordinary sort of pilot whom you could meet a hundred times a day without recognizing him—just an ordinary pilot, launched airborne for the duration.

And if Chittenden hadn't aggravated my sensitivity and made me nervous, I'm certain what should have been the climax to my training career—the Solo Night Cross-Country—would have been more of a success.

It's not difficult to see his insidious effect on my career . . .

It was his habit, on the trying occasion of each Solo Night Cross-Country, to shout a few words of encouragement to the pupil before he hurtled away into the night—"Best of luck! Watch your take-off! See you in three hours!"—or, more wittily to some unfortunate who'd strayed even on a day cross-country and landed far from home—"Don't get lost!"

But his final words only jolted me. He just hollered in, "Get lost!"—and slammed the door.

And I did.

I'd been in the air about forty-five minutes when Kaloo turned up, yawning and stretching himself. He must have been asleep down by the tail when Chittenden slammed the door. That was one of the strange things about Kaloo, he always liked flying with me and he always seemed to know where I was, whereas I never seemed to know where he was until he unexpectedly appeared.

I was delighted to see him and gave him some humbugs I'd had in my trouser pocket a long time. Night cross-country flights I had found out long ago were only long stretches of uneventful boredom—until it came to landing, so Kaloo's present companionship was doubly welcome.

Kaloo sat beside me and blinked at the passing night, panting rhythmically with his tongue dangling, waiting patiently for the night to pass, while his mind drifted hazily onward towards an egg-and-bacon breakfast.

Soon he became bored with watching passing stars, so he stretched out his long fore-legs on the floor, spread out his great toes once or twice just for the good feeling of doing so, dry-swallowed a couple of times, yawned; gave me a smiling over-to-you look, and got his head down.

It was well over an hour later as I was circling a red-winking beacon somewhere over Sussex by the sea (I think) and trying to decipher its cunning winks while trying at the same time to stop the plane slipping out of the air, when the unusual tilt of the floor woke him up. He must have been in the middle of a confused nightmare, mixed up with one of his wild chase-me games.

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Before I could get in a word of explanation, he was bounding wildly down the fuselage with my carefully ruled map of South-East England in his mouth. I tried coaxing, but the madness of the moment was in him. I tried to find another humbug —but my pocket was empty . . .

He knew I was at a disadvantage and that I couldn't let go of the control-column. And he knew within half-an-inch how close he could come without my fingers closing on the map.

Each time, growling like distant thunder, he came toward me and offered me the map; then sprang triumphantly away and savaged Kent, Surrey and Sussex for a while before stalking back to me, like an unco-ordinated grasshopper ready to spring, with the map in his mouth.

When for the twentieth time he sidled close, in magnificent desperation I let go of the control column . . . flung myself on the map . . . and held on . . .

For long seconds the world spun fearsomely. What had been, a minute before, smooth-circling flight with an occasional lurching side-slip, now became horribly distorted chaos. Both Kaloo and I were in the grip of something beyond our control. Together we stuck like fly-paper against the side of the plane.

When at last I managed to grab the control-column, the red beacon sailed by overhead instead of being in its rightful place down in the Sussex countryside. I gazed at it with wide-eyed disbelief.

When most of our world had settled down again in its natural place the only remaining problem was the compass, which, in a drunken swirl, persisted in the spinning game of which the rest of us had tired.

Even Kaloo seemed nonplussed. He sat upright against the side-wall, dizzy and squint-eyed, leaning a little sideways with a silly, embarrassed look on his face.

I concentrated on the immediate task of getting us all back home to Chittenden on time.

But the compass was slow to pull itself together; then forty minutes later I found I was on the wrong course as one of Kaloo's tooth-marks had dented out a vital figure: I was flying 86 degrees instead of 186.

But luck was with me.

Suddenly, just to the south, when I thought it should have been to the north, I spotted the unmistakable tracery of the Thames Estuary, with its white cliffs and its wide silver vee of smooth water. Soon I was crossing it and breathing more easily as we made our way due south down into dear old Sussex by the sea again.

My chief concern was now to get us down safely before we ran out of petrol and were forced to land in some outlandish spot. So, as soon as the lights of a small friendly aerodrome showed up ahead, I headed for them.

I knew full well Chittenden would have something barbarous to say when I phoned him at three-thirty in the morning to tell him I was safely down at yet another strange aerodrome, but I could at least emphasize the fact that his dog was in safe hands . . .

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We landed as if on cotton-wool: I wish Chittenden could have seen such a perfect landing.

But the moment I opened the door of the plane, Kaloo was out — and away. Evidently he'd had enough of flying for one night. For a moment he looked at the stars and scented the wind; then loped off north-west, away into the greying-night, loping just a little lop-sidedly, a little off-balance, as if his homing device was still somewhat unsettled.

I could see he was eager to beat me home for his egg-and-bacon breakfast.

I strolled into the aerodrome Watch Office . . .

I always savoured a strange thrill at reporting in at unknown aerodromes. There was a peculiar delight in having to angle out of the Control Officer the whereabouts of his aerodrome without giving him the impression I was lost.

On this occasion I could have sworn the man at the table was dozing at his post, his head on his hands, and his eyes glazed. I strolled non-commitally to his desk, spread out my map of South-East England, pocked with a thousand tooth-marks, coughed once or twice; then posed a few general questions to him, while vaguely indicating most of South-East England with a generous gesture, and an engaging smile.

The effect was breathtaking.

For a moment he seemed bemused—even benumbed—then he staggered to the door, grabbing his tunic off the back of his chair as he went. There was some sharp shouting outside. Then he was back again with his tunic on and with two frightened airmen with him. They were dressed in old-fashioned high-neck jackets. In spluttery English one of them stuttered out, "For YOUS the war is over!"

Surprise, surprise! Was I surprised?

But even he was wrong about the war being over—there were still four more years to come.

From the prison-camp at Sagan I did write to Chittenden—one of those sadly-cheerful letters saying how well I was bearing up, despite the difficulties. And I suggested that, as I was the only prisoner in Stalag Luft 3 who had arrived straight from his training school, his present cadets might like to adopt me as their sole prisoner-of-war and send me parcels and other gifts.

I also pointed out I was still continuing the good work and was thinking of volunteering for Escape Duties so that any day now he could expect to see me hurrying towards him across the tarmac . . .

I'll say this for Chittenden—he did reply.

But his reply only took up two lines of the letter-sheet: "Don't!" was his first word, followed by, "Have you seen my dog?"

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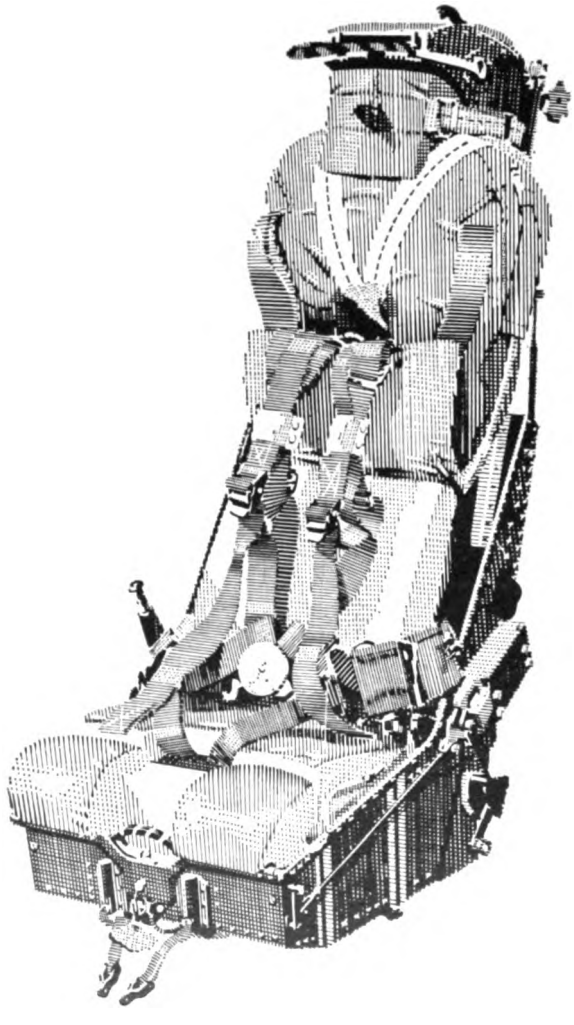
1966
1967



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CONTRIBUTORS (Career Notes)

AIR MARSHAL SIR ROBERT H. M. S. SAUNDBY, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L.

A 2nd Lieutenant in the Royal Warwickshire Regiment in 1914, he was seconded to the Royal Flying Corps in 1915, qualifying as a pilot the following year; he served in Nos. 40, 24 and 41 (Fighter) Squadrons on the Western Front in 1916-17, and was awarded the Military Cross for destroying a Zeppelin airship.

After the First World War, he took a Seaplane course and became a Flight Commander at the Calshot Flying Boat Base, Calshot. In 1918 he was awarded the Air Force Cross. In 1919 he served in the Directorate of Training; 1920-22 as a Flight Commander, No. 1 Flying Training School; proceeding to No. 45 Squadron, Iraq in 1922; in 1925, as a Squadron Leader commanding the Aden Flight, he was awarded the Distinguished Flying Cross for gallantry in operations in the hinterland of Aden; and in 1926 he was Chief Instructor, No. 4.F.T.S., Egypt.

Returning to England later that year, he served with No. 58 (Night Bomber) Squadron 1926-27; took the R.A.F. Staff College course 1928; was Squadron Leader, Air Staff, Wessex Bombing Area, 1929-31; served in the Directorate of Operations and Intelligence, Air Ministry until 1933, when he took the I.D.C. course as a Wing Commander. From 1934-1936 he was an Instructor at the R.A.F. Staff College. Serving as Deputy Director of Operations 1937-38, in 1939 he was appointed Director of Operational Requirements. In 1940 he became Assistant Chief of the Air Staff (Technical), with the rank of Air Vice-Marshal.

Sir Robert was appointed S.A.S.O. at Bomber Command in November, 1940; from 1943 to 1945 he was Deputy Air Officer Commanding-in-Chief, Bomber Command with the acting rank of Air Marshal, during which period he was created a Knight Commander of the British Empire. In consequence of the results of a crushed spinal fracture, sustained in a crash whilst on operations in Belgium in 1917, he was invalided from the R.A.F. in 1946.

In 1956 he was created a Knight Commander of the Order of the Bath. In addition he is an Officer, Legion of Honour (France); Commander, Legion of Merit (U.S.A.); Grand Officer, Order of Leopold II and holder of the Croix de Guerre with Palme (Belgium).

Appointments held since retirement

Member of the Minister of Pensions' Central Advisory Committee 1950-66; Member of Council of Air League of the British Empire 1948-59 and now Vice-President; Chairman Central Council R.A.F. Association 1946-58 and Life Vice-President from 1959; Vice-Chairman Council of Territorial and Aux. Forces Associations 1947-60; was President 1947-61 and is now Patron of Metropolitan Area, British Legion; Chairman, Berkshire Territorial and Aux. Forces Association 1956-61; Member of Council of Union Jack Club 1948-61; Chairman of Executive Committee of Central Council for Care of Disabled 1953-55; and appointed Deputy Lieutenant of Berkshire, 1960.

Publications

"Flying Colours," 1919; "Centenary Book, Piscatorial Society," 1936 (Ed.); "A Fly-rod on Many Waters," 1961; "Air Bombardment, the Story of its Development," 1961.

Recreations

Fly-fishing; Entomology.

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WING COMMANDER D. L. ELEY

Wing Commander D. L. Eley joined the Royal Air Force from Cambridge University Air Squadron in 1944. He graduated from Cranwell in 1945 and after a series of courses on Mosquitoes, Wellingtons and Lancasters, piloted Lincoln night bombers with No. 61 (City of Lincoln) Squadron at R.A.F. Waddington until 1949. This tour included three detachments to the Canal Zone in Egypt. After completing the C.F.S. course he returned to Cranwell as a flying instructor in the advanced phase and in 1951, on attaining an A1 category became the first Standardization Officer. At the commencement of the technical cadet scheme he was posted to the R.A.F. Technical College at Henlow as the second in command and C.F.I for the Cadet Wing where he served until 1955. Following the A11 Weather Jet Refresher course on Meteors at R.A.F. Manby and the Bomber Command Bombing School at R.A.F. Lindholme he commenced a Canberra conversion at R.A.F. Bassingbourn. However promotion to Squadron Leader caused a change of plan and he spent the next 2½ years as the Schools Liaison Officer for London and Kent. From 1958 to 1960 he commanded Durham University Air Squadron. Whilst on a one year tour as Deputy Base Commander at R.A.F. Christmas Island, he had a grandstand view of the American nuclear tests in 1961. After helicopter conversion he Commanded No. 110 (Hyderabad) Squadron at R.A.A.F. Butterworth from 1962 to 1963 and at R.A.F. Seletar from 1963 to 1964, flying Sycamores on operations in Malaya and Whirlwind Xs in Borneo during the Indonesian confrontation. Subsequently he was awarded the Ahli Mangku Negara (A.M.N.) at an investiture at the Istana Negara (Royal Palace) in Kuala Lumpur by the Yang Di Pertuan Agong the first king of Malaysia. From 1965 after completing the helicopter instructors course he has served on the staff of the School of Army Aviation at Middle Wallop, as C.F.1 and in command of Flying Wing.

AIR COMMODORE J. G. TOPHAM, D.S.O., O.B.E., D.F.C., R.A.F.

Joined the Royal Air Force in 1939 on a short service Commission. Completed flying training by the outbreak of the war and was one of the original members of No. 219 night fighter Squadron; initially flying Blenheims, later Beaufighters.

He flew operationally with this Squadron for 3½ years, then became Wing Commander Flying at No. 54 (Night Fighter) O.T.U. He commanded No. 125 (Newfoundland) Night Fighter Squadron from October 1943, until December 1944, and finished the war as Wing Commander Flying at No. 51 (Night Fighter) O.T.U.

Following Staff College Training in 1945/46 he commanded a Spitfire Wing, as part of the British Commonwealth Occupation Force in Japan, and returned in 1948 for a tour in the Air Ministry in the Directorate of Manning.

In 1951 he again completed a tour as Officer Commanding Flying at a Night Fighter O.C.U., and in 1953 served a tour in the Far East on the Headquarters Operations Staff.

Following a short tour on the Operations Staff of No. 11 Group, Fighter Command, he was posted to command R.A.F. Waterbeach, as a fighter station, and in 1961 he joined the staff of No. 12 Group as Group Captain Operations.

He was a member of the 1963 Imperial Defence College Course, and as an Air Commodore became Commandant of the R.A.F. College of Air Warfare, Manby, early in 1964. His appointment as Commander Royal Air Force, Persian Gulf dates from July, 1966.

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WING COMMANDER R. F. PEMBERTON, M.C., T.D., M.A., R.A.F. (Retd.)

Wing Commander R. F. Pemberton was born in 1892. He began work as a bank clerk in 1910 and joined the Royal Sussex Regiment (T.A.) as a private, transferring to the Royal Engineers (T.A.) in 1911, in which he was commissioned in 1912. In the First World War he served as a signals officer in Gallipoli, Egypt, Sinai, Palestine and Syria; and he was with Lord Allenby's cavalry during their advance to Jerusalem, Damascus and Aleppo. Between the wars, he took his degree at Cambridge and served in the R.A.F. Educational Service (civilian) from 1925 to 1939, when he was recalled to the Army. In the Second World War he served with the Royal Signals (T.A.) in North Africa and Greece, where he was captured in 1941 and thereafter spent four years as a prisoner-of-war in Germany. In 1945 he was commissioned in the R.A.F. Education Branch and served as a staff officer (education) at the Air Ministry and at Headquarters Fighter Command until 1952, when he was superannuated and became librarian (civilian) at the R.A.F. Staff College, Bracknell, from 1952 to 1962, when he finally retired.

WING COMMANDER J. F. L. LONG, M.A., R.AF. (Retd.)

On retiring from the Royal Air Force in 1964, Wing Commander Long became adviser on Soviet foreign policy and military affairs at Radio Liberty in Munich.

From 1944 to 1950 he served in ACAS(I)'s department and on the Joint Intelligence Staff. He learned Russian at London University and at the Joint Services Language School, Crail.

He is the author of "Modern Russia: an Introductory" (Duckworth), 1957 and has contributed to various journals on Soviet topics. Wing Commander Long lectured regularly at the R.A.F. School of Intelligence and at the Staff College, Andover.

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Book Reviews

Marine Aircraft of the 1914-1918 War, by Heinz J. Nowarra (Harleyford Publications Ltd., Letchworth; 210 pp.; fully illustrated; 60s.)

Thirteenth in the highly-popular Harleyford series of big-page reference books, *Marine Aircraft of the 1914-1918 War* is a companion volume to the well-established titles on fighter aircraft and reconnaissance and bomber aircraft of that period.

The formula is the same as before, with a page of photographs and descriptive copy concerning each type, or group of types, opposite a three-view drawing of the aircraft to the 1/72 scale favoured by model-makers. Adoption of a standard scale has necessitated the use of two-page fold-over sheets for the larger drawings. Although this must, inevitably, add to production costs, it is justified, as it permits direct comparison of the sizes of the aircraft depicted. It has, however, prevented listing of the aircraft in alphabetical order under each country, as this would have complicated the printing and binding of the book unduly.

A comprehensive index overcomes any problems that this might have caused; so there should be no grounds for criticism. The same is true of the varying quality of the pictures. As the publisher points out, many of the 500 photographs are more than 50 years old. Their shortcomings might have been taken care of by a first-class commercial artist by appropriate touching up; but this is something that Harleyford has never done. It believes that its readers much prefer photographs which are unretouched and therefore 100% genuine.

In this case, the subjects are of absorbing interest. Most aviation enthusiasts are familiar with the fighters and bombers of 1914-18, but even flying-boat enthusiasts will be surprised to see what an immense variety of seaplanes, flying-boats and ship-based aircraft were used by the combatants in aviation's first major war. Some of the more unusual, included in this book, were the twin-hulled triplane Labourdette-Halbronn, the Oertz Flugschooner tandem biplane and the little St. Raphael flying-boat which was built around the fuselage of a captured German L.V.G. C.V. landplane.

The ingenuity of naval aviation pioneers, in the days before proper aircraft carriers were available, is reflected in pictures and details of aircraft operating from platforms on battleship gun turrets, lighters towed behind destroyers, decks of submarines and even from the top wing of a larger carrier-aircraft. Armament ranges from darts to heavy-calibre cannon, and it is enlightening to learn that even 50 years ago German companies were building flying-boats with wing spans of up to 142 feet.

In addition to all this, *Marine Aircraft* contains details of some 80 different types of airship that were used on naval duties in 1914-18, and of well over 100 ships from which aircraft were operated. The result is one of the most browse-worthy publications of recent months.

J.W.R.T.

A Killing for the Hawks. By Frederick E. Smith (Harrap; London, 252 pp.; 22/6 net).

The author has obviously been very thorough in his research to enable him to write so convincing and reasonably accurate a story of war in the air during the second half of the First World War; as these events took place before he was born.

He acknowledges his indebtedness for some of the material in his book to several **authoritative** writers on flying in the First World War, some of whom wrote from personal experience.

From this basis he has written a highly sensational fictional novel covering events in a S.E.5 (fighter) Squadron between 1916 and 1918. With obvious imaginative descriptive powers he makes his accounts of air battles, characters in the R.F.C. and R.A.F. and day-to-day events in the lives of members of the Squadron exciting and interesting reading.

Whether his imaginative descriptions of sexual encounters add to the interest of his story is a matter for the readers sensibility.

A.H.S.

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Alone over the Tasman Sea by Francis Chichester and **War Birds: the Diary of an Unknown Aviator** by Elliott White Springs (Temple Press Books, London; 226 and 166 pp. respectively; each 18s.)

As this review is being written, Sir Francis Chichester is on his way home, alone in a small sailing craft, somewhere in the South Atlantic, after rounding the Horn. This may be the feat for which he will be best remembered by future generations; but those of us in aviation will continue to rate equally highly the earlier achievements that made him one of us — achievements such as the 1,450 mile solo east-west crossing of the Tasman Sea in a de Havilland Moth lightplane, in 1931, which forms the subject of *Alone Over the Tasman Sea.*

This book is one of the first of a series of aviation classics that are being reprinted by Temple Press Books, bringing to today's reader some of the truly great books that have been available previously only in libraries or as expensive second-hand items. Although published originally in 1933, under the title *Seaplane Solo,* it makes just as exciting reading as it did then, and is illustrated with the original half-tones.

It is a tale of high adventure. Hopping over the Tasman in three stages, via Norfolk Island and Lord Howe Island, Chichester met with disaster while preparing for the last leg of the flight. The seaplane was wrecked by a night gale. Refusing to be beaten, he stripped the wreck down to the last nut and bolt, and rebuilt it with the help of a few islanders. Weeks later he flew on through a great tropical storm of blinding rain, waterspouts and high winds, using navigation instruments, chart-plotting, log-keeping, all in the open cockpit of a seaplane vibrating so harshly that he could not write if his elbow touched any part of the fuselage. What better raw material could one wish to have for any book?

Second of the Aviation Classics reprints is *War Birds,* perhaps the most famous of all books written about combat flying in the 1914-18 War. First published in 1926, it was — and still is — illustrated with drawings by Clayton Knight. Although sub-titled *The Diary of an Unknown Aviator,* Elliott White Springs disclosed after a number of years that the diary he had edited was that of a pilot named John MacGavock Grider.

The general tone of the book is summed up in the following paragraphs:

" Clay and Springs got separated from their men after a dogfight the other day and decided they'd have a look at Hunland by themselves. They found a formation of ten Hannoveranners and jumped on them. These Hannoveranners have been licking us all so regularly that they wanted to make sure of getting one so they both leapt on the rear plane to make sure of it and one took him from above and the other below. The rest of them mixed in and they had trouble getting out of it. They kidded each other all day about what rotten shots they were and that afternoon Rainor of 56 flew over to tell them that he was down below and saw their Hannoveranner crash. They thought he was kidding them at first but he gave them the pinpoints and they flew over there again and sure enough there was the crash. Our infantry pushed the next day and they went up in a tender and got up to the crash. They were stripping it when the Hun artillery opened up on them and all they brought back was the black crosses off the fuselage and the machine-guns. The pilot's seat looked like a sieve where Clay had got in a burst from below and the cowling was full of holes from above where Springs was decorating the observer. That's some shooting.

" I saw Springs the other day in Boulogne. He said his girl at home sent him a pair of those Ninette and Rintintin luck charms. Since then he's lost five men, been shot down twice himself, lost all his money at blackjack and only gotten one Hun. He says he judges from that that she is unfaithful to him. So he has discarded them and says he is looking for a new charm and that the best one is a garter taken from the left leg of a virgin in the dark of the moon. I know they are lucky but I'd be afraid to risk one. Something might happen to her and then you'd be killed sure. A stocking to tie over my nose and a Columbian half dollar and that last sixpence and a piece of my first crash seem to take care of me all right . . . "

Alas, they didn't, for that was the last entry before Grider was shot down and killed.

J.W.R.T.

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The annual subscription is £1 for all, except widows and dependants of deceased officers, for whom it is 5s.

Full particulars and forms of application can be obtained from:

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43 Squadron, by J. Beedle (Beaumont Aviation Literature, London; 336 pp.; illustrated; 38s.)

As a follow-up to its history of No. 9 Squadron of the Royal Air Force, Beaumont Aviation Literature — an offshoot of the well-known aviation bookshop — has produced a very comprehensive book on 43 Squadron, the "Fighting Cocks." It deserves the widest possible readership, not only for its own qualities but because, if it sells well, we are promised further books in the same series. It is important to have as many as possible of the achievements of the R.A.F. recorded in this kind of detail, with personal contributions by Squadron personnel, while our Undefence Ministry still permits the existence of a Royal Air Force.

The first Commanding Officer of No. 43, on its formation in April, 1916, was Major W. Sholto-Douglas. Today, as Marshal of the Royal Air Force The Lord Douglas of Kirtleside, G.C.B., M.C., D.F.C., he contributes the Foreword to Mr. Beedle's book. In it, he points out that the Squadron was the first to undertake ground attack as a deliberate act in 1917, the first to perform squadron aerobatics in tied-together formation between the wars, and the first to equip with the Hawker Hunter, in which it became as famous for its formation aerobatics as it had been a quarter of a century earlier with the biplane Fury.

When it flew into action in France in 1917, its pilots flew Sopwith 1½-Strutters, which were by then obsolete and somewhat fragile, in that they would break up if handled with the ebullience characteristic of the time. These factors, allied to inexperience and wrong tactics, cost 35 casualties in April alone, and by the end of that month only six of the original crews remained. The picture gradually changed. Only one month later, No. 43, according to the official history of the 1914-18 War in the Air, "definitely established the novel development in the employment of aeroplanes directly to assist troops on the ground, operating in fact as 'tanks of the air.'" During the Third Battle of the Scarpe, it operated to such effect that a much-feared enemy counter-attack failed to materialise.

This book is packed with first-class personal reminiscences, which show that the author has done his homework well. One of the best concerns the Gamecock fighter with which No. 43 performed some of its memorable aerobatic displays. Service pilots complained of wing flutter, but Gloster's test pilot failed to induce flutter on a particular aeroplane "and expressed his doubts as to the fact that it did so. He was silenced by the famous Dick Atcherley, then a P.O. with 23 Squadron, who dived to within twenty-five feet of the tarmac, pulled out and disappeared upwards in a frightening Blurr-r-r of flutter."

There could be no better way to conclude this review than to quote the last full paragraph of the book: "So long as . . . the current clutch of Fighting Cocks . . . (apparently) refuse to take anything seriously, continue to fly at one tenth the regulation safety height, take the mickey out of all and sundry, deflate the pompous, de-hydrate the station goldfish pond or bust up the mess bingo sessions with wild yells of 'beer' you may rest assured of one thing else. That when occasion demands that they should forsake these pursuits in order to leap into the air to knock the stuffing out of the Queen's enemies they will be found, as has always been habitual and customary in 43 Squadron, doing the job as well as anybody and a darned sight better than most." **J.W.R.T.**

Heroes and Aeroplanes of the Great War, 1914 - 1918. By Joseph A. Phelan (Arthur Barker, London; 128 pp.; fully illustrated; 42/- net).

The outstanding feature of this book are the excellent coloured plates, line drawings and sketches of aircraft and famous airmen of the combatants of both sides in the First World War, full use being made of the 9" x 12" pages. The text alongside the pictures covers a wide field of information; from the birth of flying in the quaint elementary aeroplanes (illustrated), it proceeds to describe the aircraft, armament and well-known personalities engaged in air combats 1914-18. An Appendix gives an extensive list of air aces and the number of aircraft destroyed by each.

This is a vivid pictorial presentation of the men whose fragile aircraft changed the world's thinking about the ways of waging war. **A.H.S.**

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Atlantic Wings 1919-1939, by Kenneth McDonough (Model Aeronautical Press Ltd., Hemel Hempstead; 132 pp.; fully illustrated; 90s.)

This is a bad time for people with normal-size bookshelves. At least half of the new aviation books published this year have a giant-size format, with pages 11 inches deep, or more, putting them into the class of the glossy " prestige " volumes that are bought to lay around on coffee tables. This particular book is, however, super in content as well as in size and is unlikely to spend much of its life lying around uselessly.

The author, Kenneth McDonough, has long been recognised as one of aviation's finest artists. To ensure the authenticity of detail in one recent oil painting, showing D.H.2 fighters returning from a combat sortie over the Western Front in the 1914-18 War, he travelled to France and made innumerable sketches of the buildings over which the aircraft are flying, as they are today. Similar attention to detail is reflected in *Atlantic Wings.* When, for example, Clarence Chamberlin's Bellanca is shown circling a transatlantic liner, the latter's four slim funnels and cruiser stern put the scene into historical perspective.

Chamberlin's Bellanca is one of twelve famous aeroplanes which form the main subjects of the book. Each is shown, for the first time, in full and accurate colour in a 1/72 scale five-view general arrangement drawing, supplemented by black-and-white perspective sketches of details such as cockpits, landing gear, engines and tail units. There are photographs and biographical details of the aviators who flew the aircraft, as well as descriptions of the aircraft and of what they achieved.

Six of the aircraft still exist, and Mr. McDonough drew many of his sketches of these " from life." This is, undoubtedly, a major reason why his book is so much more satisfying than the average history written by somebody sitting in an office with a pile of reference books and old photographs. His text, also, is highly readable. One would hardly expect it to contain new facts; but it puts the various transatlantic attempts into perspective and gives some insight into the kind of people who made them.

Almost all were heroes, but to the reviewer the one who seems to have been worst treated by historians was Jim Mollison. Lindbergh is remembered, rightly, for his superb New York to Paris solo flight in the *Spirit of St. Louis* in 1927. Few people could name Mollison as first to make the more difficult east-west solo crossing, five years later, in a tiny 120 h.p. Puss Moth. Yet this achievement called for a rare mixture of navigational skill and endurance (the flight lasted more than 30 hours) and was remarkable in that the total bill for petrol and oil was a mere £11 1s. 3d.

The text is devoted mainly to the twelve attempts by the aircraft shown in the colour plates; but reference is made to other notable transatlantic flights of the period. In sum, therefore, *Atlantic Wings* forms the finest tribute currently available to the men whose daring and skill pointed the way to what is now a routine and very safe transport operation. J.W.R.T.

Why Vietnam? By Frank N. Trager. (Pall Mall Press, London; 238 pp; 35/- net).

This book describes the Indochinese peninsula both before and after the arrival of the French, outlining the events that led eventually to communist control of North Vietnam, the defeat of the French at Dien Bien Phu and the Geneva agreements of 1954.

The inevitability of the involvement of America in Vietnam becomes evident through this chronological presentation of the struggles of Vietnamese nationalism against alien domination; of the Geneva agreements of 1954; and of the shift from a colonial war to a war against communism by a nation seeking independance.

The author reviews what is at stake in South East Asia and why the present communist threat to South Vietnam must be resisted in the vital interests of other free nations.

At this time of divided opinion in Britain of the rightness of the intervention by military help being given to South Vientnam by America and contingents of the British Commonwealth, this book vindicating the decisions of three successive Presidents of America as to its vital necessity, should be widely read. A.H.S.

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THE ROYAL AIR FORCE BENEVOLENT FUND was founded in October, 1919, by the late Viscount Trenchard to secure lasting benefits for the personnel of the Flying Services and their dependants in commemoration of their achievements during the Great War 1914-18.

A Memorial to the Officers and Men who lost their lives stands on Victoria Embankment overlooking the Thames, and was unveiled by H.R.H. The Prince of Wales in July, 1923. An inscription, in remembrance of those men and women of the Air Forces of every part of the British Commonwealth and Empire who gave their lives in the 1939-45 war, was unveiled by Marshal of the Royal Air Force Viscount Trenchard at a ceremony on 15th September, 1946.

The Fund exists for the relief of "distress" or need, actual or potential, among past and present members of the Royal Air Force, Royal Auxiliary Air Force, Royal Air Force Reserves, Women's Royal Air Force—and their dependants. It must, therefore, be prepared to help:—

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The Royal Air Force Benevolent Fund exists for a Service that trains as well as fights in the air, and provides relief not only for cases arising from casualties in war, but also for those arising from flying accidents and ordinary distress in peace. It must therefore be prepared to render help indefinitely, and not merely to meet temporary emergencies.

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Pageant of the Air, by Kenneth Munson (Ian Allan Ltd., Shepperton; 192 pp.; fully illustrated; 55s.)

One of the most surprising things about flying is that it has produced so few really great artists or writers. On the art side, one can count the Keith Shackletons, Leonard Bridgmans and Clayton Knights on one's fingers, and so pathetic is the support such men receive that even the masterly brush of Frank Wootton is now devoted to horses rather than aircraft. Literary masters of the air are even scarcer, and one begins to run out of names after listing Charles Lindbergh, Harald Penrose, Ernest Gann and Antoine de St. Exupery — all, by no means coincidentally, great pilots.

When, however, one turns to the art world of the camera, the picture is different. During the last fifty years, the challenge of a new dimension, allied to the commercial demands of the press and industry, has inspired a 20th century generation of artists to produce countless masterpieces, utilising to the full the ever-improving capabilities of photographic techniques. For proof, one has only to turn the pages of this superb collection of more than 200 photographs, all beautifully printed in large size on heavy art paper.

It called for considerable courage on the part of the publisher to accept such a book. A picture book of (mainly) familiar aeroplanes — as opposed to rare birds — selling at 55s. cannot be expected to become a best-seller. However, just as it is the ambition of every young architect to design a church, so it should give a publisher satisfaction to know that he has recorded for all time a really worthwhile collection of facts or photographs that might otherwise have been lost to future historians or lovers of what is good.

Pageant of the Air is such a book. The artists whose work it contains include the well-known " old masters " — Charles Sims, John Yoxall, Cyril Peckham — and those who have followed in their slipstream in a supersonic age — Ian Macdonald, Michael Chase, Leslie Hammond — together with those like Stephen Peltz and Brian Service who, although best known as aircraft " portrait painters " are no less capable of showing their subjects against a dramatic backcloth when the occasion merits.

Apart from a brief introduction and a few words of caption by each print, the author has, wisely, let the photographs tell their own story. One must, nevertheless, with a certain envy, congratulate Mr. Munson on the success he has had in thinking up titles for each picture. Seldom facetious, they add to one's enjoyment of the whole, and make this a gloriously nostalgic possession for anyone who loves aeroplanes and flying as more than just a means of making money.

The reviewer's favourite among the photographs? It is almost impossible and would be quite invidious to say — but it was no coincidence that that particular print ended up on the cover! J.W.R.T.

British Aviation, The Pioneer Years, by Harald Penrose (Putnam & Co., Ltd., London; 607 pp.; fully illustrated; 84s.)

A book by Harald Penrose is always worth waiting for, as the reader can be assured of a liberal helping of fine English prose from a man who writes about flying with unexcelled authority. However, some people had reservations when they heard that he was tackling an enormous, highly-detailed book that would record, more or less definitively, " the work, struggles and achievements from 1903 to 1914 of the British aviation pioneers whose foresight produced the weapons of aerial warfare for two major wars and the vehicles to spread air commerce and high-speed communication throughout the world." Was Penrose the right man to undertake historical research, especially when some of his views were known to clash markedly with those of established and respected aviation historians like Charles Gibbs-Smith?

We now have the answers in a four-guinea book that is worth every penny, even for those who will not agree entirely with some of Mr. Penrose's assessments. Quite apart from the pleasure of reading a history into which a frightening number of man-hours of study and writing have been poured, the very large number of photographs — many hitherto-unpublished

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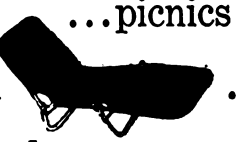
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— make *British Aviation, The Pioneer Years* as indispensible as any of the other volumes in Putnam's superb series of aviation histories.

Penrose prefers to call his book a " saga " rather than a history, because he has concentrated on men rather than machines. Many pioneers are seen in a new light. Maxim, for example, is often portrayed by historians as a grey-beared old dabbler who was so frightened when his giant, highly-impractical flying machine left the ground inadvertently that he never again tested it. Harald Penrose comments: " It is impossible to overstress the far-seeing genius of Maxim imaginatively delving into problems that might occur with a flying machine and deciding how best to overcome them." Having said that, he produces so many new facts about Maxim's experiments that it is difficult not to agree. Later, he treads bravely, and by no means unconvincingly, on dangerous ground in comparing the first flights of the Wright brothers with that of the Maxim machine a decade earlier!

Perhaps wisely, Mr. Penrose makes no dogmatic pronouncement on whether or not A. V. Roe made the first powered flights in Britain in June 1908. He simply quotes Roe's own modest claim to have done so — as well as contradictory evidence — and Humphrey Roe's statement in the April 1910 *Journal of the Royal Aeronautical Society* that the best of the flights covered about 60 yards at a height of about 2 feet. He adds, " Such evidence, made less than two years after the event, must be reasonably credible compared with imprecise interpretations by other people 30 to 50 years later." It is difficult to disagree and wrong to set oneself up as a final arbiter in the absence of indisputable evidence.

All the pioneers were great. All contributed to flying as we know it. There has never been a better or more readable tribute to them than this Penrosian saga.

J.W.R.T.

The Montgomery Legend. By R. W. Thompson. (Allen & Unwin, London; 276 pp.; 16 illustrations; 32/- net).

This well-known author uses all his skill as a trained journalist to debunk some of the myth and legendary greatness attributed to Montgomery and the unmerited slur they cast upon Auchinleck.

The late John Connell, in his excellent biography, undoubtedly vindicated Auchinleck from the unjust and unfounded criticisms of his ability at the time of his dismissal and this book refutes absolutely that it was Montgomery who changed the morale of the Eighth Army from a craven strategy of scuttle to one of attack. The change in the nature of warfare in the Western Desert in 1942, when vastly greater British strength had been built up, coincided with the arrival of Montgomery and did much to give rise to this part of the legend.

However naive Montgomery may have been, believing what he wanted to believe of his own greatness, there is no doubt that Churchill provided Britain with the right kind of "Showman," "Champion" and "Hero" figure, at the right time in the turn of our fortune in the Second World War, under whose leadership we won victory after victory, turning the tide of war in our favour.

In his desire to dispel some of the unmerited qualities of generalship built up at the expense of others and by the glamour of his victories, the author seems to have been a little unkind to Montgomery. A.H.S.

Rescue at Sea. By Captain John M. Waters Jr.—Chief of the Search and Rescue Division, U.S. Coastguard Headquarters. (D. Van Nostrand; London; 264 pp.; 57 illustrations; 48/- net)

This book on Search and Rescue is written from the personal experiences of the author, who as a combat officer, ship Captain and rescue aircraft Commander took part in the events he describes.

It is a story packed with adventure at sea and in the air by dedicated and selfless men, which includes first hand accounts of disasters, medical rescues, disappearances, murder and piracy; well supported by excellent illustrations. A.H.S.

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The Anatomy of the Aeroplane, by Darrol Stinton (G. T. Foulis & Co., Ltd., London; 321 pp.; fully illustrated; 63s.)

Almost the only common factor that *The Anatomy of the Aeroplane* shares with the other big-page books reviewed in this issue of the *Quarterly* is that it is concerned with aircraft. Gone is the glossy art paper; line drawings predominate, rather than photographs; and brief, cleverly-conceived captions give way to semi-technical explanations and formula. It may sound dull, but it is not.

Darrol Stinton, ex design office technician and Farnborough test pilot, has set out to produce a thoroughly up-to-the-minute counterpart of the "Flight Without Formula" type of text-book which has been the bible of young people wishing to learn about aerodynamics and structures for half a century.

In his preface, he writes that "*The Anatomy of the Aeroplane* was started in 1960 as a set of supplementary notes to the author's annual lectures on Aero-Structures given at the Empire Test Pilots' School. The lectures were intended to give embryo test pilots an insight into the reasons for aircraft not being shaped in ways that fitted the often more elegant thories. In so doing the inherent capabilities and limitations of an aeroplane became more apparent. The capabilities and limitations were seen to be functions of specific requirements: those formalized statements of human needs that cause aircraft to be made as useful and safe as possible within the 'state-of-the-art' at a given time. The seeming dichotomy of the two worlds of theory and practice . . . is resolved by looking at the development of an aircraft as a response to a set of requirements . . . The aim of the book is to show students of aeronautics how requirements affect the application of theories, causing aeroplanes to be twisted, bent, cambered and kinked, to end up without the flowing perfection of their original, idealized, forms."

Looking at machines like the Victor, Buccaneer and Phantom, which give the impression that they can only have been given shape with plasticine and a knife in a wind-tunnel, rather than on a drawing board, one can see what Mr. Stinton is getting at. He does so, generally, in the kind of language that his intended reader can understand, and the illustrations are clear and comprehensive.

Variable-geometry, supersonics, and the concepts which gave birth to designs such as the TSR.2 and North American OV-10A counter-insurgency aircraft, are covered. Nobody can complain, therefore, that *The Anatomy of the Aeroplane* is not up-to-date. The text is as accurate as one would expect from its authorship, and the depth of detail generally satisfactory. One reviewer criticised the sections on static and dynamic aeroelasticity as being too short, adding that the couple mode nature of flutter is not brought out. The level of readership at which the book is aimed would probably respond vaguely: "Is that so?" J.W.R.T.

The Story of a North Sea Air Station. By C. F. Snowden Gamble. (Neville Spearman, London; 446 pp.; 28 plates; 27 text illustrations; 63/- net).

This book records the part played by those at the R.N.A.S. Station, Great Yarmouth, in the First World War, combating the menace of the Zeppelin airships and disputing the enemy's efforts to establish air supremacy over the North Sea. Many other interesting events during this period and those leading up to the war are also included.

The author traces the growth of the air arm of the Royal Navy and that of the Imperial German Navy's air arm from 1908 to 1918. He gives prominence to the achievements of the enemy, as well as those of British airmen in the operations covered by this book.

Survivors who have personal recollections of the events described, will realize the extensive research that the author must have undertaken to achieve the historic truth and accuracy of the difficulties which faced a growing air arm; he even includes the smallest details of the changes in uniforms, occasioned by the amalgamation of the R.F.C. and R.N.A.S. into the R.A.F.

The excellent plate illustrations cover German air stations, airships and air operations of

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both the R.N.A.S. and Germans. The line drawings are in themselves a pictorial history of the progress in aircraft construction, from the Maurice Farman Longhorn to the Sopwith Schneider and De Havilland 9.A.

The author ends his story of those who served so gallantly from the Great Yarmouth Air Station with — " being what they were, and doing what they did in the way they did it, they had made it a little easier for valiant men elsewhere to win the War."

This is indeed an excellent and most interesting book. A.H.S.

Britannia at Dartmouth. By Captain S. W. C. Pack. With Foreword by Admiral of the Fleet Earl Mountbatten of Burma. (Alvin Redman; London; 326 pp.; 29 illustrations; 42/- net).

A story covering over a hundred years of officer training for the Royal Navy in the cadet-training ship "Britannia."

In the early years described it was indeed a tough training; discipline was rough with its "bread and water" for minor offences and "ceremonial flogging" for the more serious ones, until public outcry reduced it to more moderate levels.

Instant obedience was the foundation of the preparation of cadets for their future service as officers, whether Royal Princes or Commoners; love and loyalty to the great traditions of the Royal Navy the keystone of their training. The book is greatly enlivened by descriptions of such events as the first meeting between Princes Elizabeth and Prince Philip in July, 1939, at Dartmouth and personal anecdotes from "old boys," some of these served later in the Royal Flying Corps and Royal Air Force in the First and Second World Wars, attaining high rank before retirement.

The authors research must have been very thorough, as he covers every detail of the training and describes with equal thoroughness the atmosphere of life in the " Britannia."

Captain Pack's obvious unbounded pride in the great traditions of his Service undoubtedly guided his pen when writing this book, which will bring inspiration to present and future officers of the Royal Navy.

A.H.S.

NOTICE

HISTORY OF 578 SQUADRON

Ex-members of 578 Squadron at Burn are requested to contact Mr. R. D. Burn, 1 Bannard Road, Maidenhead, Berkshire, with any information or photographs which would assist him in compiling the Squadron History.

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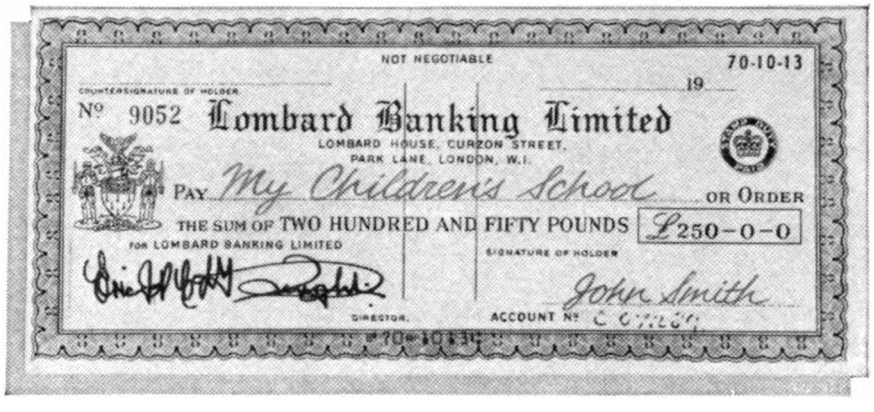

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Reflections on Modern War

By Air Marshal Sir Robert Saundby, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L.

THE First World War was described by the then British Prime Minister, Lloyd George, as the "war to end wars." Many people hoped, and some perhaps believed, that he was right, and that a new and happier era for mankind was at hand.

The fighting ended in an Armistice, followed by a formal peace treaty, the Treaty of Versailles, and the League of Nations was set up in the hope of ensuring the peaceful settlement of disputes and the rule of international law.

The Treaty of Versailles, however, created as many problems as it had solved. It was economically harsh and militarily weak, which was the exact opposite of what it should have been. Germany's deep discontent led to her resurgence under Hitler, and his attempt in 1939 to liquidate the last remaining vestige of the Treaty of Versailles — the Danzig Corridor — initiated the Second World War. The League of Nations had proved to be quite impotent, either to restrain Germany or any other aggressor, or to serve the cause of peace anywhere in the world.

After a military victory in 1945/46 so complete as to leave them undisputed masters of world affairs, the Allies set up the United Nations Organization, with much the same objects as the former League of Nations. Infused by a totally unjustified feeling of optimism, which unfortunately still clouds our judgement, the Western World assumed that the five Great Powers with permanent seats on the Security Council of the United Nations would normally see eye to eye about the major problems of the world. So, although each of the permanent members of the Council had the power of veto, it was all too readily assumed that it would rarely, if ever, be used.

It was soon apparent, however, that Russia intended to exploit her military victory to bring, by force or fraud, as many formerly independent countries of Europe as possible under the rule of Communist governments answerable to the Kremlin. Before effective action could be organized, East Germany, Poland, Latvia, Esthonia, Lithuania, Bulgaria, Rumania, Hungary and Czechoslovakia were swept into the Communist bag. Then NATO came into being, and the rot was stopped.

The United Nations Organization did not prove to be much more effective than the former League of Nations. The Russians have used their veto in the Security Council more than a hundred times — we have used ours only once or twice — and have now reduced it to complete impotence. As the General Assembly has only the power to recommend its resolutions, most of the machinery of the United Nations has been paralyzed, and any hopes that it could keep the peace, protect the injured and weak, and uphold the rule of law have disappeared.

For nearly fifty years international Communism, inspired, directed and often

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financed by Moscow, and more recently by Peking also, has been busy fomenting rabid nationalism, exploiting grievances, and prompting subversive activities. While it would be absurd to pretend that they have created all the troubles, they have certainly been at pains to exacerbate all our difficulties, to take advantage of our democratic freedom in order to spread subversion and do the maximum damage to the economies of capitalist countries, and to force them to give up their overseas bases. But it is now half a century since the Bolshevik Revolution, and Russia has slowly reverted to type. It may well be that the Kremlin today, though better organized and more powerful, is no more hostile, suspicious, unco-operative and unreliable than was St. Petersburg under the Czars in the nineteenth century.

It is largely due to Communist influence and propaganda, reinforced by an incredibly naïve and short-sighted anti-colonialist policy on the part of the United States, that the protecting and guiding Powers have been forced to withdraw prematurely from so many undeveloped countries. Their withdrawal has resulted in the creation of a large number of ramshackle new states, economically weak, politically unstable, and violently nationalistic. Most of these States have arrived at, or are heading for, bankruptcy, civil disorder and general misery, conditions which the Kremlin believes will favour the spread of Communism.

All these new States have a vote in the United Nations, and theoretically rank equal with the Great Powers, which has created an air of total unreality in world affairs. When Britain and America together can be out-voted by three tiny and irresponsible States, which are usually concerned only to further their own interests or vendettas, the true nature of world affairs is lost sight of in New York. The delegates to the United Nations live in a dream-world of lobbying, votes, and futile non-stop talking.

Almost all Governments, however, are at pains to keep up the pretence that the United Nations is an impartial body, with the will to settle disputes in a just manner, and the power to make its decrees effective. Threats to peace are still solemnly brought before the Security Council, although everyone knows that it is impotent. Only once has it been effective, at the outbreak of the Korean war, and that was because the Russians, in a huff, had temporarily withdrawn from it. This is a mistake that they are never likely to repeat.

In spite of the terrible loss of life and the widespread material destruction caused by the Second World War, and the very real desire of ordinary people all over the world to live in peace, we have had since 1946 more widespread war, violence, bloodshed, riots, and civil unrest than in any other period of twenty years for a very long time. Communal riots in India in 1948 on a vast scale, wars in Kashmir, Korea, Cyprus and Malaysia, the Chinese rape of Tibet, the Indian annexation of Goa, Suez 1956, the Indo-Pakistani conflict, the Vietnam war, and Aden. In addition there have been innumerable revolts and civil wars, mostly in the newly emergent African States. Indeed, very many places which in my younger days were happy, friendly, orderly and reasonably prosperous, are now hate-ridden, strife-torn, bankrupt, and on the border-line of famine.

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Nearly all these outbreaks of violence have been long drawn out and inconclusive. The main reason for this is the shadow of The Bomb. The frightful nature of nuclear warfare has quite rightly made major war unthinkable, and this has had a profound effect on almost all hostilities since 1945. Only when there was no threat of escalation into a major war was there anything like a decisive end to the fighting. The reason is, of course, that the threat of escalation, whether real or imaginary, has brought about so many political restrictions on the correct use of military forces that the West has usually been at a very grave disadvantage. In Korea, the most serious of these conflicts until Vietnam, General MacArthur was superseded because he wished to use his military forces in a correct manner free from political restrictions. He was not allowed to do so, and the fighting dragged on until in the end we accepted a most unsatisfactory stalemate rather than risk the expansion of the conflict into a major war. And it should be noted that at that time China had no nuclear weapons, but the fear that Russia might become involved was sufficient.

The Communists long ago realized the political and military value of nuclear blackmail. Again and again we have accepted severe restrictions on our military action, so that wars that we could have won quickly with a relatively small effort have absorbed considerable forces and dragged on and on until a temporary and unsatisfactory solution has been found.

The unhappy results of these military efforts have given rise to the view, especially in progressive circles, that war can settle nothing. Let us, so runs the fashionable argument, get out of everything and stay out, even if it means giving in to our enemies and letting down our friends—those who have trusted us. The foolish belief gains ground that if we remain inoffensive, support the United Nations, and try to be friends with all and everybody, we shall be left alone to enjoy our luxurious standard of living. We can then cut our defence forces to the bone, and rely on Summit meetings, economic sanctions, and the strength of our moral position.

This comfortable world of make-believe has suddenly been shattered by the recent Arab-Israeli war, which had a rapid and decisive course that makes Hitler's idea of a blitzkrieg look like a slow-motion film. How did this come about?

Ever since the State of Israel came into being in 1948 and was recognised—and indeed guaranteed—by the United Nations, it has been under constant threat from its Arab neighbours, especially from Egypt and Syria. They refused to recognise it from the beginning, and have consistently done all they can to foment anti-Jewish feeling among their peoples, and to hamper and harrass the Israelis in every possible way.

The day after Israel came into being, the Arabs attacked. They achieved only a minor success, and the tiny, unorganized State of Israel survived. Again in 1956, under intolerable pressure from the Arabs who surround Israel on three sides, the Jews had to fight for their lives and their homes. Unfortunately, France and Britain intervened, in a way so inept and clumsy from both the political and military point of view, that we allowed the United Nations, backed by the United States and Russia in an unholy alliance, to rob us—and more important—the Israelis, of the military

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victory that had already been won. A cease-fire was declared, and the frontiers of Israel were left where they were when the fighting ended. These frontiers were absurd, inconvenient, and indefensible in every sense of the word, but there they were—frozen by United Nations foolishness and lack of realism. A U.N. peace-keeping force was put in to help maintain these preposterous frontiers.

For ten years Israel put up with those boundaries, and also with the Egyptian illegal refusal to allow their ships, or ships carrying cargoes destined for Israel, to use the Suez Canal. They also put up with the festering sore of the Arab refugees in the Gaza strip. These refugees could have been re-settled by the United Nations, and Israel offered to do what she could to help, short of allowing them to settle in Israel, but the Arabs would have none of it. They preferred to keep alive the idea that the refugees would one day return to their former homes in Palestine, and they fomented hatred of Israel in the refugee settlements. They recruited a " Palestine Liberation Army " from among the younger refugees in the Gaza strip.

In June this year, Egypt suddenly demanded the removal of the U.N. Force which had for ten years policed the Gaza strip and the fortress of Sharm el Sheikh, which controlled the entrance to the Gulf of Akaba and the sea passage to the important Israeli port of Eilat.

After the illegal closure of the Canal to Israeli commerce in 1956, Israel had spent much money in developing the port of Eilat, through which all Israeli trade with the south and east, and especially her imports of oil, had passed. Following the removal, with unseemly haste, of the U.N. Force by U Thant, the Egyptians announced the blockade from Sharm el Sheikh of the Gulf of Akaba, and moved a large force of armour and infantry to the south-western frontiers of Israel. At the same time a violent campaign of hatred and incitement to war reached its climax in Egypt and Syria. The harrassing of Israeli border settlements by small arms and mortar fire from Syria was stepped up.

It is fair to say that other Arab States, notably Saudi Arabia and Jordan, have been less intransigent in their attitude to Israel. Their recent pact with their arch enemy, Nasser, was forced on them by popular clamour and was against their best interests.

Israel realized that a massive campaign against her was being mounted, by Egypt in the south, Syria in the north-east, and by Jordan in the east, all backed by Russia Although the State of Israel was guaranteed by the United Nations, and backed by the United States, France and Britain, the Israelis correctly guessed that in the event of a concerted Arab attack, little or nothing would be done to help them. Their salvation would depend on themselves alone, and when they found themselves on the very point of being attacked from all sides, they struck. Of course, this was very wrong of them. By United Nations standards, the aggressor is the nation which, however goaded and throttled by her neighbours, is the one that fires the first shot. Whether Israel did actually fire the first shot or not, there is no doubt that Egypt and Syria were guilty of initiating acts of war against her. The Arabs were unquestionably the real aggressors in this conflict, and the Israelis were forced to act as they did or perish.

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The decisive result of the war, which was over in less than a week and ended in an overwhelming military victory for Israel, surprised most people and also, apparently, the Russians. It did not surprise me, though I did not expect quite so rapid and complete a victory on all three fronts. But the Israelis were fighting for their lives, their families and their homes. They knew well that if they had been defeated there would not have been Israeli refugees, as today there are Arab refugees, but only Israeli dead. Indeed, the Arabs have admitted as much. An Egyptian spokesman, interviewed before the outbreak of the war, boasted of the coming destruction of Israel. Asked about the problem of Israeli refugees, he said that no doubt the U.N. would take care of them, but added grimly that he did not think there would be many. By contrast, Arab morale, nourished only by a sour hatred of Israel, was low, and soon cracked under the hammer blows of the Jewish air and armoured forces.

As soon as the Russians realized the extent of the Arab defeat, but not before, they began loudly to demand an immediate cease-fire. The remarkable thing about the Arab-Israeli war is that it was fought, on the Israeli side, in a context free from the fear of escalation into a major war. Their military forces could therefore be used in accordance with correct military principles, without political restrictions. It showed that, freed from such restrictions, the forces of a modern civilized power could make mincemeat of a much larger force of second-rate troops, however well equipped. In modern war, provided that it can be fought without crippling political restrictions, first-class technology, training, discipline and morale can meet and utterly defeat vastly larger forces. The loosely associated Arab consortium of 100 million people was no match for the compact, well-organized and unhibited Jewish nation of some 2½ million.

From the start of the fighting the Security Council, as usual, proved totally ineffective. It is to the credit of the United Nations that the Assembly, at the time of writing this, has declined to adopt the Russian resolution branding Israel as the aggressor, and requiring her to withdraw her forces behind the pre-war frontiers. So if the U.N., on this occasion, has not been able to do the right things, it has so far at least avoided doing the wrong ones.

It is much to be hoped that some of the Arab States will soon realize that they have been betrayed into adopting wrong courses. Perhaps the clamourous insistence of Egypt, which has no oil, on their withholding supplies of oil from Britain and America, with consequent serious loss of revenue, and the Russian attempts to capture some of their former markets, may hasten their return to sanity.

In all this there is much food for thought. For some time the rulers of Zambia, Uganda, Tanzania and other African States have nurtured ideas of great African armies over-running and conquering Rhodesia, Mozambique, and South Africa. They had better pause and think again. Like the Israelis, the Rhodesians and South Africans would be fighting for their lives, their families, and their homes. Like the Israelis, their technical knowledge, discipline, training, and morale would be immeasurably superior to those of their attackers. They could employ their forces in the correct manner, secure in the knowledge that there was no danger of bringing on a major war. There can be no shadow of doubt that if these African States were

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foolish enough to try it on, they would suffer a defeat even more catastrophic than that which the Arabs have just received at the hands of Israel.

I suggest that there are two main lessons to be learned from the Arab-Israeli war. The first is that no reliance can be placed on the United Nations to protect the victims of aggression and, apart from NATO and SEATO, not much on guarantees of military aid. When it comes to the point, no effective action is likely to be forthcoming. Every nation, therefore, must in the last resort depend on its strength — its armed forces, its economic resources, and its strategic position. The tendency nowadays is to reduce our armed forces, on the argument that we — one of the richest countries in the world — can no longer afford them, and to abandon our strategic positions. We seem to fail to understand that when we abandon a strategic position, such as Aden for example, it does not just disappear or remain neutral. Before very long it will fall into the hands of those who are dedicated to our overthrow and ruin.

The second lesson is that a modern civilized community such as Israel, Rhodesia, or South Africa, is perfectly capable, not only of defending itself against aggression by second-rate hordes, provided that escalation into a major war is unlikely, but of dealing them so crushing a military defeat that it would take them decades to recover from it. This is a lesson that the newly emerged African States, puffed up by their apparent importance and influence in the little dream-world of the United Nations Assembly, should take to heart. Fortunately they have at hand an instructor in Dr. Banda, of Malawi, if they will but listen to him.

They should all try to realize that their antics in the United Nations have no genuine significance, and take a long hard look at the world as it really is.

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AIR POWER AND OUR FUTURE WORLD ROLE

By Air Commodore Neil Cameron, C.B.E., D.S.O., D.F.C.

THE interested observer of the international scene need not be privy to the confidential and secret documents of Whitehall to realise that Britain's world role is now changing, and to a degree seldom equalled in our history. He will, however, find it a great deal more difficult to decide exactly what the eventual outcome of this era of change might be. The wide variety of imponderable factors likely to affect the future could tender even an intelligent guess wildly off target. This change process is certain to go on for at least the next decade, and such important matters as our possible membership of the European Economic Community, our future role in the Far and Middle East and others, will have to be settled before our ultimate position becomes clear. Unfortunately one cannot nowadays exactly shape one's own destiny in the world. The development of a fully operational Anti-Ballistic Missile system in the Soviet Union, coupled with the deployment of a multiple warhead for their ICBMs and both supporting a counter-force strategy, could so upset the nuclear balance as to make present strategies, concepts and force deployments a subject for historians. There is also, of course, China's bomb.

The one-time American Secretary of State for Foreign Affairs, Dean Acheson, has recently commented that, in his opinion, " Britain has lost an Empire but still not found a role." Both aspects of this comment could, of course, be argued to be true, the second one painfully so. The more astute would qualify Acheson's all-embracing statement to the extent that the British Empire was not lost but most of it brought to independence by a progressive programme of development. All would agree, however, that our future role is not immediately clear, though in fairness, and as has been mentioned above, many of the transitional factors affecting the situation are quite beyond our power to control or even to influence.

This, then, is the highly complicated situation facing the planners as they attempt to devise some sort of strategy and associated force levels for the years ahead. It is an unenviable task, and not helped by a serious national financial position. It is the purpose of this article to discuss some of the factors affecting our world role and to see what part air power might play within our overall defence posture.

THE ECONOMIC POSITION

" On taking office in October 1964 the Government decided to carry out a far-reaching examination of the nation's defence needs during the next decade, with two objects in mind: to relax the strain imposed on the British economy by the defence programme and to shape a new posture for the 1970s, believing that the defence plans of the previous Government would have imposed an excessive burden both

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in resources and foreign exchange" (Cmnd 2901). The National Plan pointed out that, if 7% of the Gross National Product continued to be spent on defence, this would have a limiting effect on the much needed increase in production and the development of the social services. We had to export more and import less, and industry had to be re-equipped and modernised. The defence target specified a reduction to 6% of the Gross National Product by 1969-70. This reduction inevitably must have a significant effect on commitments, strategy, force deployment and equipment.

In addition, the balance of payments deficits of 1964 and 1965 led to a large volume of debt, and required that a substantial surplus be achieved by the early 1970s. In July 1966 the Government resolved to decrease overseas expenditure, which, as far as defence was concerned, stood at £287 million per year.

So these two factors, a reduction to 6% of the Gross National Product for defence plus a substantial decrease required in overseas spending, have meant that a full reappraisal of our defence role worldwide had to be made. In passing, it should be mentioned that although the United States currently spends 8.4% of her G.N.P. on defence, the main nations of Europe—France and Germany—spend 6.6% and 5.1% respectively. So if we consider our role in future to be mainly a European one, and taking into account France's ambitious defence plans, we do not really compare too badly.

A CHANGING WORLD

It is doubtful if history can or will provide a period of equivalent change such as the world is going through now. This embraces a conceivable upset in the nuclear balance, the Sino-Soviet dispute and the current convulsions going on in China; the disruptive tribal confusion and large-scale slaughter in parts of Africa; the re-emergence of Japan as soon to be the third industrial power in the world; to mention just a few. But there are also the changing attitudes of individual powers to be taken into account; will the United States ever again get involved on the mainland of Asia to the extent they are at present, or indeed to any extent at all, and if this happens what will take the place of western physical power in Asia? How much longer will the USA be prepared to be the major NATO partner in an era of possible nuclear uncertainties? Will Japan emerge from her post-war pacifistic tendencies to play her part in the stability of Asia? Will the Chinese in fact attempt to dominate in this area and beyond? American Defence Secretary Robert McNamara, in his recent Montreal speech, has stated categorically that America does not intend to continue the role of world policeman, and Mr. Walt Rostow, special White House Assistant to President Johnson, in a recent lecture at Leeds University, has said that "History will show in South-East Asia, as it has displayed in many other parts of the world, that the international status quo cannot be altered by the use of external force," and he went on to add that "the struggle in Vietnam might be the last great confrontation of the post-war era."

It is against this sort of background that Britain is planning her future world role.

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The decisions which may be reached will not be easy ones to implement. There will be many pressures from Commonwealth countries and from areas of previous involvement to influence the decision makers one way or another. There will be threats and ultimatums, and there may be misunderstanding and possibly bloodshed. But the fact remains that this country, in the light of the financial circumstances and the changing world picture, must determine its role for the rest of the century.

THE NUCLEAR BALANCE

For years now we have been forced to shelter under the so-called East-West nuclear balance of power in which Britain continues to play a part — however much some people may choose to discount it. This balance has now been rudely interrupted by the threatened full-scale deployment of Soviet ABMs. In addition, it is widely believed that the Russians have developed the multiple individually guided re-entry vehicle, known as MIRV, which could revolutionise nuclear strategy. It would mean that each Soviet missile despatched could carry ten or more individually guided warheads in the megaton class, which could neutralise the Americans' numerical lead in this field and make a counter-force strategy as far as the Soviets are concerned a realistic possibility. The mere existence of an efficient Soviet ABM system (including an antidote to Polaris), coupled with a counter-force strategy, could exert a significant psychological influence on both superpowers. In this situation it is not impossible to imagine a suddenly belligerent Soviet attitude towards Western Europe, coupled with a reduced US interest in tempting providence by widespread nuclear guarantees.

CHINA'S BOMB AND ASIA

The first two Chinese hydrogen bombs have now been detonated, and informed commentators believe that they were dropped from aircraft. This is, of course, a far cry from an operational thermo nuclear capability, but if the speed of the development of the weapon is any guide, the delivery capability will not be very far behind. Certainly Russia and the United States are already thinking in terms of ABM systems to combat possible Chinese aggression; but even the present state of the art in China is quite sufficient for some nuclear " sabre rattling " in the East. The question is, what effect will the Chinese bomb have upon the other nations of Asia, and how do Asians themselves view the problem of living with China in the nuclear years ahead. Does China indeed wish to dominate the rest of Asia? Alastair Buchan, Director of the Institute of Strategic Studies, has suggested in a recent article that there are three possibilities: the development of an Asian nationalism coupled with external assurance of action by the great powers in the event of Chinese blackmail; a possible entente among the stronger non-communist powers—India, Japan, Indonesia and perhaps Australia; and finally a polycentric Asia in which Peking, Delhi, Tokyo, Djakarta and Canberra seek their own alignments and guarantees. The answer is anyone's guess, but as far as this country is concerned the tendency will be towards a full-scale effort in the defence of Australia, New Zealand and our other dependencies in the area, but great reluctance to get involved again on the mainland of Asia.

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THE MIDDLE EAST

The events of the past month, both in Southern Arabia and in and around Sinai and the Gulf of Aqaba, indicate that a new page of history is about to be written in this theatre. Our intentions in Southern Arabia are to try to leave behind a stable situation and to act as guardians to the Sheikhdoms, at least for the time being. It is likely that we will be completely out of this area by the mid-1970s, apart from a toe hold on Masirah Island, where a good airfield exists. It is to be hoped that without delay H.M.G. will look for oil supplies from elsewhere, and also alternative sources of power, otherwise we are in for intermittent periods of trouble with a good chance of some sort of involvement. Whilst Mr. Christopher Mayhew is right in his argument that the Arabs have got to sell their oil, recent events show that they are prepared to forego revenue for short periods, and certainly the oil " have-nots " can make it difficult for the producers to get it to market.

As far as the rest of the Middle East is concerned, King Hussein made a very relevant speech at the United Nations in June to the effect that the so-called Israeli aggression was but the first round of a very long war. Already the Soviets are reported to have largely repaired the ravages of the Israeli attacks, certainly as far as Egypt's aircraft order of battle is concerned, and all could be ready for the next round. Goodness knows what was evolved during the Nasser-Podgorny talks in Cairo earlier this year, and by gaining the increasing dependence of the Arabs it may be that it is the Soviet Union and not the Israelis who have won the victory.

It is perhaps still a little too close to the events to draw any useful lessons as regards any British part in the dispute, but there is no doubt that, had we achieved sufficient international backing, we would have tried to play some part in opening the Straits of Tiran to shipping. The general coolness of the American reaction was notable.

The question is what may be the next step in the area. Professor Laurence Martin, writing in the *Spectator*, has put forward the view that the Middle East may now be enjoying the last fling of conventional youth before nuclear arthritis sets in. Certainly it seems only a matter of time before nuclears are introduced to this area, and there would seem to be a message for British defence planners here. There is a view which says that if Egypt and Israel had nuclear weapons they would effectively deter each other. This may be so, but it would be a very uneasy balance of terror, knowing the national characteristics of at least one of the contenders.

Clearly during 1966-67 there has been a determined Western effort to shift the balance of power in the Middle East from Egypt towards Saudi Arabia. Unfortunately it is not Cairo or Riyadh where the power now lies, but in Moscow. There can thus be some justified apprehension about the future stability of the area.

EUROPE AND NATO

As has been indicated in previous paragraphs, the future policy of H.M.G. is towards non-involvement in Asia (unless where Australia and New Zealand are concerned); disengagement from Southern Arabia; and a reluctance to do anything in the Middle East (this may be easier said than achieved) unless possibly under a

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UNO flag. What is left? Obviously the defence of the United Kingdom remains top priority, but, unlike the past, it now becomes easily the main raison d'être for our defence forces. Inevitably this means full and wholehearted support for NATO, taking our membership more seriously militarily than we have in the past. Though the Army (as a result of the Eden agreements) has taken up fairly permanent residence in the North German plain, our Navy and Air Force have, usually for good reason, been " double counting " elsewhere for contingencies and actual operations. When discussing NATO it is suggested that too little account is now being taken of the Mediterranean; the Royal Navy made an over-hasty departure from it some years ago to satisfy their " presence " fixation in the Far East. They will probably come to regret it. The Air Force has held on in Malta and Cyprus against some pressure to withdraw, though as our future strategy becomes clear our influence in the Mediterranean should be increased—a situation likely to be welcomed by our NATO allies.

Our application for membership of the EEC will once more raise the question of a European Defence Force and the possibility of creating a consolidated organisation, even to the point of unbalancing to some extent national defence forces. It certainly seems nonsensical for most of the NATO nations to carry out their own flying training schemes — to take but one example.

It will not be easy to change military thought towards a NATO-aligned Navy, Army and Air Force and apart from that largely a UK-based force. It has big implications for strategy, tactics and equipment, and the sooner we learn to live with it the better. What it will amount to is that a very large percentage of our armed forces will be declared to NATO — perhaps then we will stop being so sensitive about filling some of the high appointments in the organisation.

AN INTERVENTION CAPABILITY?

Having suggested that the main defence role for the UK is centred firmly on NATO, is there now a requirement for this country to maintain an intervention capability and what might it be used for? Whilst it is impossible to forecast precisely the types and circumstances of intervention operations in which the country could become involved, it is nevertheless believed that the Government would wish to be able, in certain circumstances, to offer military assistance to allied and friendly nations or to operate under the UN flag.

Intervention operations are often classed under three headings — limited war, counter-insurgency and internal security. The term limited war is an unfortunate one; the limitation is seldom specified but implies a scale of warfare that many believe unlikely to recur, and certainly if it does we would try to avoid getting involved in it. The upper level of operations, then, is likely to be sub-limited but at the same time still a degree above counter-insurgency.

It is an unattractive feature of our times that sophisticated arms (as yet, as far as we know, only conventional) are being supplied to countries with unstable governments or rulers who may take irrational actions, and present trends suggest that the

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Soviets are prepared to increase the range of advanced weapons available to non-bloc countries. Whilst it is true that there is a tendency now for this country to be withdrawing slowly from Asia, and perhaps more quickly from Arabia, there is a strong case for a mobile, flexible, adaptable intervention force to be held in the United Kingdom — as a contribution to operations with allies, to go to the help of our Commonwealth friends and dependencies if requested, to operate with UNO in peace-keeping, and to fulfil present defence commitments.

The force could be made up of Navy, Army and Air units. It could provide a degree of insurance against the unforeseen; it could increase the political and military options open to Ministers, and perhaps more important the knowledge of its existence could provide a deterrent to irresponsible action against our nationals or overseas investments.

We still have a significant garrison in Hong Kong; we must indicate to Australia and New Zealand that we are prepared to go to their help (as they have so willingly done for us in two world wars), and we have commitments to Fiji and other islands in the area. It is quite possible to indicate that we are never again going to get involved in the Middle East, Far East and Africa; but if we are to remain in the big power league as the Prime Minister has suggested, we cannot at this stage dispense with our intervention capability or run it down to the extent of killing its operational potential.

A PERIPHERAL STRATEGY

A glance at the world on a Mercator's projection shows that our future main strategic interests are in the truest sense of the phrase "poles apart." Whilst it is likely that we will continue to have some base facilities in Malaysia/Singapore until the mid-seventies our possible reactivation of these bases from then on must be in doubt. It would thus seem sensible to make use of Australian facilities if that country is willing. It is the strategic future of Australia and New Zealand which in the 1970s and beyond is the main reason for our continued interest in the area, and though it might not be necessary to station forces permanently there, we should certainly have the capability to deploy, land, sea and air units regularly as an earnest of our intention to go to their aid should the need arise.

The peripheral aspect of the strategy applies with a firm base in Australia, but with mounting and staging facilities in the British Indian Ocean Territories and other islands in conjunction with Australia. The list includes Cocos, Gan, Masirah and the Seychelles, whilst the potentialities of Aldabra (as an addition to this list) are currently being evaluated. This group of islands could give us a useful strategic toehold on the periphery of Africa, Southern Arabia, India and other parts of Asia. It would also mean that our aircraft (after the demise of the carrier) could support naval forces and our own mercantile marine in the Indian Ocean, and in general keep open a useful range of options should intervention be necessary for one reason or another.

Obviously air transport will play a vital part in this type of strategy during a

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period when overflying rights for military aircraft get more difficult, and this particularly applies to the Middle East. The speed and carrying capability of some present and planned military air transport would allow us to support the peripheral strategy using the west-about route through the United States, and the addition of Aldabra to our island staging posts could make possible a route across and if necessary around Africa to Australia which is considerably shorter than the west-about route, with complementary financial savings from a cost-effectiveness point of view. Certainly, we should now be planning an insurance against the possible closure of the Middle East route for one reason or another.

Whether our intervention is with allies, under a UN flag or in support of our own nationals, the peripheral strategy will require a totally new approach from the three Services and an interdependence never before achieved.

THE PART FOR AIR POWER

This year's Defence White Paper quite rightly suggests that the chance of general war has greatly diminished. Sir John Slessor, in an article in *The Times*, adds a postscript " but no-one in their senses would suggest that we can afford to ignore the possibility altogether." This is surely particularly apposite with a certain amount of hiccoughing likely soon in a previously stable nuclear balance. Our nuclear effort is at present in the hands of the Royal Navy with Polaris (and this missile will need hardening), but the time has come to consider how and if we intend to stay in this field after Polaris goes. It may be that an aircraft system will be the successor, though perhaps directed more at China and the several other nations who may by then have gone nuclear than against the Soviets.

There will undoubtedly now be a strong lobby, by those who do not understand air power, as a result of the demise of the AFVG, to abandon any idea of a further strike/reconnaissance aircraft after the F-111 or at least to decide on a much simpler, cheaper, less sophisticated subsonic aircraft with limited range. They will argue that Britain's strategic posture has changed (as indeed it has) and that there is little chance of strike aircraft being used again, and anyway strike operations would be out of the question politically.

This lobby seems entirely to miss the point that all operations (with the possible exception of jungle guerilla type) rely on a favourable air situation. In a changing world, with bombers, Mach 2 fighters and anti-aircraft missiles being freely distributed by the Soviets and others, if our forces are to " live " at all when engaged, they must be covered by the deterrent effect of a first-class flexible strike force. This was admirably demonstrated by the limitation of the operations of the Indonesian Air Force (and there is another lesson to be learnt from Sinai). Now, it can be argued that H.M.G. will never again get involved in Indonesia confrontation type operations and this may be so. But it would be a brave forecaster who would suggest that with a power struggle tugging apart both the Middle and Far East, we will never again be called on to play some part by land, sea or air — or all working together. We can only play our part under the deterrent umbrella of an efficient, all-weather

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force of strike aircraft. It need not be a large one, but big enough and sophisticated enough to persuade the opposition air force that we can do them a damage. In the next decade or two this will not be achieved by a subsonic, fairly simple aircraft of short range, and the other two Services must appreciate this. Until they can be certain of having the backing of this air strike force, they cannot attempt intervention. The Navy and Army should be the most vociferous supporters of a new strike aircraft to replace a percentage of the V bombers—to supplement the F-111s and eventually take over from them when they phase out of the inventory. The Secretary of State has referred to the AFVG as the "core of our aircraft programme." It could equally well be stated that strike aviation is more than ever the core of any responsible defence programme, and in sufficient strength to be credible to possible adversaries.

As has already been suggested, a peripheral strategy is only supportable with an adequate air transport force, coupled with an intervention army, highly trained and equipped for this particular type of mobility. In the 1970s and beyond the work horses of our strategic and tactical airlift will be the VC10 and the Hercules. But a breakthrough in air transport is just around the corner with the American C5. This remarkable aircraft not only has a huge airlift capability but it can also carry its load into the tactical area with a good short landing performance. It can accommodate all the reasonable intervention equipment of the British Army, and if the C5 had been operating during the Berlin airlift, twelve of these aircraft could have done the job of 225 tactical freighters of the day. This is the sort of degree of airlift we must have if we are to adopt the peripheral strategy of mobility, and the first cost-effectiveness figures on this aircraft are extremely encouraging. It is to be hoped that we can afford the dollars to pay for it — there is no doubt that it would give the Army an undreamt-of degree of mobility and speed of reaction.

Whether on the North German plain or in intervention, the Army will require a high degree of offensive air support, particularly if operating in a theatre where some sophisticated ex-Soviet or Chinese equipment is deployed. Vietnam has once more proved that air support of armies is vital to the success of operations — a dictum which is inclined to be forgotten by both sides in times of peace. The scientific effort which is now part and parcel of the defence establishment should be applied as a matter of urgency to ensure that this type of operation is carried out to best effect. The Americans have had to relearn many of the air support lessons of the last war. Let us put our house in order by the closest possible analytical and operational study of how this can best be achieved, now and in the years ahead. The departure of the aircraft carrier from the scene by the early 1970s throws an added responsibility on to land-based air power for support of the Royal Navy, though this is no new experience. This includes responsibility for strike, air defence and anti-submarine support, and every naval operation now becomes a joint one in the truest sense of the word. To make this a success, an entirely new relationship between the Air Force and Navy has got to come about, with all the bitterness of the carrier battle forgotten. Perhaps a percentage of executive naval officers could be seconded to the Royal Air Force for a period of flying duties, so that the potential and techniques of air power are fully understood and not forgotten within the Navy as they proceed to higher ranks.

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The Royal Air Force is now shaking itself out of the traumatic experience of having several major projects dropped from their programme with the advent of the Labour Government in 1964. It would generally be admitted within the Service, with one or two regrets of a conceptual nature, that we have come out of it all quite well. It is true that we have far too many types in our inventory, for one reason or another, and this generates both technical and logistical problems. But if a successor to the AFVG is satisfactorily agreed, and with F-111, Phantom, Harrier, Jaguar, Nimrod, Hercules, the VC10, possibly the C5 and some new helicopters — we have some first-class aircraft just around the corner. The Canberra, Hunter and the V bombers have served us well, but the Service will welcome the challenge of these new types and not before time.

If we are to fulfil the sort of strategy suggested in this article we require long range, both in hitting power and transportation, and generally speaking this is being provided. But we also require a state of interdependence between the three Services — the like of which has not been achieved even during the successful days of the last war. This will require a new approach to training and to devising equipment for the three Services.

Dr. Harold Brown, formerly one of McNamara's young defence intellectuals, now Secretary of the US Air Force and the biggest current operational user of air power, has in a recent lecture in America commented that the Vietnam war could not be conducted without air power in all its various aspects, and he particularly paid tribute to the great success of the deep penetration interdiction programme. Vietnam has again confirmed the true capability of air power, and in a changing world situation and with the sort of British strategy contemplated, it comes into its own in a big way. The air power characteristics of flexibility, adaptability and strategic and tactical mobility must provide the basis of our insurance policy in the days ahead.

DELIVERY OF ARTICLES TO EDITOR

The *final dates* upon which articles must reach the Editor for inclusion in the Spring, Summer, Autumn and Winter numbers are: —

SPRING (MARCH)	22nd DECEMBER
SUMMER (JUNE)	25th MARCH
AUTUMN (SEPTEMBER)	24th JUNE
WINTER (DECEMBER)	23rd SEPTEMBER

It is sincerely hoped that contributors will not wait until the very last day before dispatching their articles to the Editor, as this can seriously disorganize the works schedule for getting the " Quarterly " to press and could delay its date of issue.

The early delivery of copy would be greatly appreciated.

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The P.1127 "Harrier Mk. 1" lands on British Commando carrier "Bulwark". Big carriers do not need V/STOL fighters, but jump-jets would be valuable aboard small helicopter carriers, to protect them against air attack and to serve as armed escort for assault helicopters.

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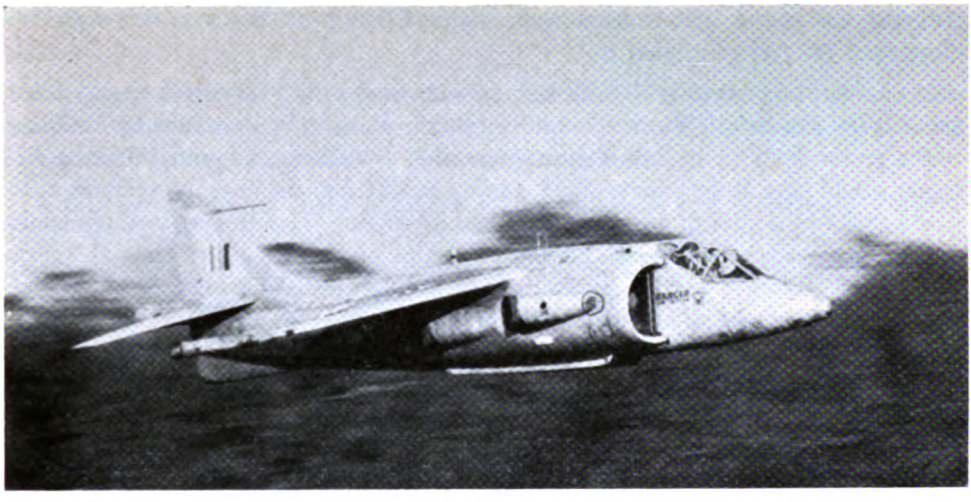

To evade enemy anti-aircraft defences, the R.A.F.'s "Harrier Mk. I" achieves high subsonic speed in low-level flight.

The RAF's New Jump-Jet

By Stefan Geisenheyner

Air Force/Space Digest Editor for Europe

HS P.1127 FGA (RAF)—these cryptic clusters stand for a significant achievement in modern military aviation. Fully spelled out, they say: Hawker Siddeley, Project 1127, Fighter, Ground Attack (Royal Air Force variant "The Harrier Mk 1").

The capabilities of the aircraft cannot be deduced however, from its official designation. The P.1127 can take off and land vertically, can fly sideways or even backward, and it reaches supersonic speeds at altitude and high subsonic speeds at sea level. It enables the RAF to revise its tactical concepts when the aircraft becomes available in numbers over the next two years. All problems surrounding the tactical employment of the V/STOL fighter have not been completely solved. But the technical concept of the P.1127 has proven feasible and reliable, opening a way for continued development of this particular variety of V/STOL technology.

From aviation's beginning, vertical or direct lift was a desired feature. Some serious work on it was carried out by early designers. But it proved so much easier to achieve flight by starting with a short ground run that the effort died away. This was understandable. The wing loadings of early aircraft were very low and the take-off run, therefore, comparatively short—sixty to 200 yards of ground roll. Even the

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Hurricane of World War II fame, with a wing loading of 25.6 lb/sq ft. needed no more than 780 feet of ground roll.

In comparison, a Boeing 707/320B has a wing loading of 113.0 lb/sq ft. and needs about 6,750 feet before liftoff. Certainly ground roll could be shortened by installing larger powerplants or by using thrust-increasing devices or catapults. But the airframe would have to be strengthened, adding weight, and the question remains as to where to land the aircraft after it has finished its mission. Lower wing loadings could also be achieved by enlarging the wing, but this creates drag problems at higher speeds. An attractive way to shorten the takeoff run is to be able to vector the engine thrust downward and so augment wing lift with jet lift, thus leading to the straightforward V/STOL aircraft.

The elimination of the runway is especially desirable for ground-support aircraft so they can be stationed close to the front lines and be on hand on very short notice. Runways are not portable. They are susceptible to both air and ground attack.

One solution to the problem is offered by the V/STOL fighter-bomber, which can go anywhere, land practically everywhere, and is easily maintainable. The HS P.1127 can claim to fill all three requirements. True, there are other V/STOL aircraft flying today or under development which are faster, more powerful, and can, therefore, carry a heavier combat load, but there is none that is simpler to operate and maintain than the Hawker Siddeley design. Such is the judgment of the Royal Air Force, which some time ago confirmed its requirement for a substantial number of P.1127s for the close-support role. On November 16, 1966, the British government finally gave the go-ahead for mass production.

The HS P.1127 was started in 1957 as a private venture by Hawker Aircraft (now Hawker Siddeley Aviation), and Bristol Aero-Engines Ltd. (now Rolls-Royce-Bristol Siddeley). The heart of the aircraft is the BS.53 Pegasus turbofan. It is the brainchild of chief designer Dr. Stanley Hooker. The Pegasus is basically a Bristol Siddeley Orpheus turbojet driving in addition a three-stage ducted fan, which has its origin in the Olympus series of the same company. This turbofan engine discharges fan air through two cascaded nozzles located on either side of the engine casing. About sixty percent of the fan air is thus diverted and the rest is passed on to the high-pressure compressor of the turbojet. The jet exhaust is guided through a bifurcated pipe to two rear nozzles, which are located in the same line on the engine as the cold-air front nozzles. The fan and the compressor counter-rotate to eliminate gyroscopic effects, which would disturb the equilibrium of the engine while running and thereby seriously impair the hover stability of the V/STOL aircraft it powers.

The dominating feature of the Pegasus is the system of nozzles which are rotatable through an arc of 100 degrees, from ten degrees forward and downward to ninety degrees backward. All four nozzles are mechanically linked, thus permitting all the installed thrust to be vectored in the desired direction. In this way the varying thrust vector demands of V/STOL at one end of the scale and climb acceleration and level speed at the other end can be met with stepless adjustment. This thrust vector principle allows the aircraft designer to employ a simple conventional jet fighter

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cockpit to which is added only one extra control in the form of the nozzle-direction lever.

This highly interesting engine design stimulated the chief designer of Hawker, the late Sir Sidney Camm, to conceive a V/STOL aircraft which was to be tailored around the Pegasus. Thus, the P.1127 prototype was born.

A preliminary design study of engine and aircraft was first prepared in August, 1957. According to this paper, the P.1127 was designed primarily for tactical strike and reconnaissance duties independent of normal airfields. The design would emphasize robustness and simplicity so that it could operate away from base for extended periods in remote forward areas.

After the publication of this proposal, which was made known to NATO and the USA, many discussions were held with the MWDP (Mutual Weapons Development Pact), NATO headquarters in Paris, and the British Defence Ministry. In January, 1958, a substantial amount of US funding was promised for the Bristol Siddeley engine, and it also appeared that the general interest of NATO in the V/STOL fighter was growing steadily. In March, 1958, Dr. Hooker of Bristol Siddeley announced details of his latest proposal for the Pegasus which promised thrust levels up to 14,000 pounds. After extensive testing of a variety of 1127 designs, including free-flight models flown at NASA's Langley Research Center, the actual construction of the first prototype began in May, 1959, as a private venture of Hawker.

A little smaller than the Northrop F-5, the original P.1127 had a swept-leading-edge anhedral wing mounted above the engine. Dominant features included large air intakes and a center-line landing gear fitted with low-pressure tires for soft-field capability and wheeled retractable outriggers at the wingtips for ground stability. The empennage was of conventional design. Though the engine thrust through the center of gravity of the aircraft provided basic stability, special reaction control valves or nozzles were fitted at nose, tail, and wingtips.

In the hover mode bleed air from the high-pressure compressor was exhausted through these nozzles to stabilize the aircraft under any wind conditions. The airflow from these valves was regulated by the movements of stick and rudder bar which operated the control surfaces in a conventional manner at the same time. The aircraft could, therefore, be flown in the hover mode as well as in the high-speed regime by conventional movements of the control column and the rudder bar. The only new feature was—as already mentioned—the Pegasus nozzle-control lever used during the V/STOL mode.

By June, 1960, the British Ministry of Aviation awarded a contract covering two prototype and four development P.1127s. The first prototype P.1127 began its tethered hovering test in October, 1960. A free-flight hover followed on November 19. Shortly afterward, the aircraft was joined by the second prototype. In September, 1961, the first transition from vertical flight to level flight and vice versa was accomplished. By 1963 the four development aircraft had joined the program, each aircraft introducing a number of new design developments.

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From the beginning, the Ministry of Aviation had sought to interest other NATO nations. After the first successful transition flight, in the fall of 1961, the position of the negotiators was greatly strengthened and, while Hawker Siddeley talked with foreign aircraft manufacturers about possible licensed production, talks on the government level in the spring of 1962 resulted in the excellent decision to form a Tripartite Field Evaluation Squadron. Britain, the US, and the Federal Republic of Germany jointly ordered nine P.1127 aircraft for this squadron, which was to be staffed by servicemen of the three nations.

The three nations together contributed about $104 million in roughly equal shares to cover the development cost of the aircraft and the engine, as well as the entire cost of the evaluation. Since the actual formation of the squadron was set to take place in the fall of 1964, Hawker Siddeley could continue developing the aircraft. The six P.1127s ordered by the Ministry of Aviation represented a step-by-step development of the original prototype. The following nine aircraft were to be a pre-production series, incorporating all the necessary improvements needed for operational use. Indeed, several improvements were mandatory. For instance, the Pegasus then had a lifespan of only a few hours, and endurance, therefore, had to be counted in minutes.

The first of the tripartite models flew in March, 1964, with several new design features. This new aircraft, subsequently designated Kestrel F(GA) Mk.1, had a fully swept wing with reduced span as compared to the early versions, a longer front fuselage to house military reconnaissance equipment, and provisions for attaching pylons on which to hang outboard stores, either fuel or armament. The aircraft in this form proved an outstanding success. Engine power had been uprated to 15,500 pounds, endurance was good enough for the close-support role, payload was sufficient, and certain refinements in the cockpit instrumentation necessary for military use were incorporated.

On October 15, 1964, the three-nation squadron became operational. The official purpose of the evaluation trials was to investigate the various aspects of military V/STOL operations, their control and logistics, including the VTOL, rolling VTOL, and STOL modes. Operational techniques and procedures in various flight conditions covering both night and instrument flying were also investigated.

One of the first tasks was the pilot's conversion training, from straightforward jets to a V/STOL aircraft. This was accomplished in minimum time at the Hawker Siddeley establishment at Dunsfold. One RAF pilot completed conversion training in the record time of forty-three minutes total flying time, including sixteen minutes of hovering and one twenty-five-minute conventional flight. The average conversion time necessary was found to be between two and three hours for the well-trained military jet pilot. This was proof of how easy it was to fly the Kestrel.

The Tripartite Squadron was disbanded on November 30, 1965, and the nine aircraft divided among the participants. Three Kestrels stayed in the UK, and six went to the US for further evaluation, flying under the designation XV-6A. Germany had decided to go another route in the V/STOL field and had, therefore, loaned its three

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aircraft to the US.

The evaluation of the V/STOL concept had vindicated its supporters. The increased flexibility of the V/STOL aircraft enabled the Kestrels to be deployed at sites requiring minimum preparation, to change sites quickly using mobile support facilities, and, most important, to disperse singly or in small numbers.

The actual flying from dispersed sites did not present any serious problems, but some complex questions of logistic support and increased difficulty of command and control became apparent. A radio net had to be set up to cover all the outlying sites. Furthermore, nearly all the ground-support equipment—bomb loaders, oxygen carts, generators, etc.—proved unsuitable for the terrain from which the aircraft could or must operate. All these vehicles eventually will have to have cross-country capability, or else large helicopters equipped as mobile bases will have to be developed.

Flying the "Harrier Mk. 1" (P.1127) from dispersed sites presents no difficulty, but problems of logistic support, command and control have not yet been fully resolved. Ground vehicles must be able to move cross-country or be airlifted.

In view of these difficulties, the evaluation squadron formulated two main tactical concepts, one of which requires only minimal logistic support at the dispersal site. In each case a primary site is set up, housing unit headquarters, maintenance elements, and communications centers, located close to an existing airfield or a road strip suitable for takeoff and landing of medium conventional transports. Subsites at varying distances from the primary site were established, on which the fighter-bombers were dispersed. These sites could either have no logistic support at all or could have full rearming and refueling capabilities if the road conditions permitted.

The first technique, which would require little or no support, would be to use the subsite only for hiding and dispersal. Refueling and rearming would be performed at the primary site. Where fully dispersed operations are required, however, logistic support becomes necessary at the subsite. This problem has not yet been solved. A US Army Bell UH-1B helicopter attached to the evaluation squadron proved to be of great help in the latter mode of operations. To sum up, dispersed V/STOL fighter

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This small clearing under trees makes an adequate airstrip for the P.1127 "Harrier Mk. 1", big enough for a short take-off roll as well as a vertical launch. Such locations could readily hide essential ground equipment.

bases cannot be maintained without V/STOL support.

In February, 1965, the British government gave Hawker Siddeley Aviation a contract to develop the P.1127 as a replacement aircraft for the Hunter, which presently serves in the close - support role. The final green light for mass production was given by the Ministry of Defence on November 16, 1966. The exact number of aircraft ordered is classified, but estimates run between sixty or more.

The P.1127 built for the R.A.F. has a more powerful engine than the Evaluation Squadron aircraft, with thrust reportedly in the 18,000 to 19,000-pound range. The span has been slightly enlarged, the internal fuel capacity is somewhat greater than the original 600 Imperial gallons, and weapon stations have been incorporated in the airframe. The first model of the RAF development P.1127 (the " Harrier ") was demonstrated in flight during the Farnborough Show in September, 1966.

It is interesting to review the RAF's reasons for choosing the P.1127 design. During the last few years two main methods of achieving V/STOL flight have been employed. One is the single-engine vectored-thrust arrangement (VT), as used in the P.1127. The other uses a composite powerplant with a combination of lift and thrust engines (CP).

The following comparison of VT- and CP-powered aircraft is abstracted from a paper published by Air Marshal Sir Reginald Emson, then Deputy Chief of the Air Staff, RAF:

> By taking into account the practical experience of V/STOL to date and relating it to the main military parameters involved in their operational employment as tactical fighters, the following points are of primary importance:
>
> *Performance*: in over-all performance there is little to choose between the two concepts. For the same gross weight and a given fuel load, the CP aircraft would have a slightly better radius of action in certain circumstances than the VT design

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because the thrust engine can be optimized for cruising conditions. In VT aircraft, however, the thrust-to-weight ratio greater than unity may be used at all times. This leads to high manoeuvrability in the turn and very rapid acceleration and deceleration.

Dispersability: Dispersability in the V/STOL concept is the ability to perform tactical operations from dispersed and hastily prepared sites. Neither of the two types can perform true VTOL from loose or sandy soil. The VT aircraft, however, can achieve a very short rolling takeoff which need not be longer than one or two aircraft lengths. It is doubtful, however, if the CP aircraft could operate at all on loose soil because the thrust of the lift jets is always, even when idling, directly downward, raising unacceptable dust clouds, producing ground erosion, and thereby causing re-ingestion problems for the engines.

Simplicity: The VT system enjoys the benefit of a single simple engine control system, a single fuel system, and a direct linkage to the rotating nozzles. Just one lever and two gauges, in addition to the controls and instruments found in a normal single-engine fighter, become necessary. The CP aircraft involves two different types of engine, and, since at least four lift engines are needed, a multitude of engine controls and instruments have to be installed. The introduction of automatics will lessen the demands on the pilot but increase the complexity of the aircraft.

Safety and Reliability: The CP system is generally held to give a greater degree of flight safety in that in the event of a thrust engine failure it should be possible to carry out an emergency landing on the lift engines alone. The complexity of the hydraulic and electric systems, however, in itself lowers the reliability of the aircraft and raises the demands put on the maintenance. Duplication or triplication of the critical systems are, under the present state of the art, not acceptable for field use. The slightly lower flight safety of the VT aircraft is easily offset by the lesser maintenance requirements.

Logistic Support: The multiengined CP aircraft will require more base maintenance support in terms of both men and equipment than its single-engine VT counterpart.

Demands on Pilot Skill: The pilot of a tactical fighter must be proficient in all types of air-to-ground combat. It is therefore essential that minimum additional demands should be made when adding V/STOL techniques to his already extensive repertoire. The VT aircraft demands few extra skills whereas the CP design needs extensive special training and drills.

The foregoing makes clear the RAF's case for the P.1127. Ease of maintenance, inherent simplicity, and, last but not least, the ready availability of the aircraft, had greater weight in the decision than did the original requirements for supersonic performance at all altitudes, long range, and substantial payload. In any event, the P.1127 is the first truly operational V/STOL fighter and an excellent tool to gather operational military experience within this wide and novel field. Nor have the possibilities for the P.1127 been exhausted. Trials on board US and British aircraft

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carriers as well as on smaller ships were quite successful, and it may well be that in the future even a simple ship can carry its own fighter protection or fast, long-distance, reconnaissance, and strike capability.

Apart from the ability to disperse in sophisticated wars, there is also the ability to operate from sites close to forward troops in limited wars. The essence of close support in operations such as Vietnam is "immediate reaction." The P.1127 concept provides a reaction time faster than anything other than a "cab-stand" type of operation, which is extremely expensive, highly vulnerable, and almost impossible to achieve wherever the main airfields are several hundreds of miles behind the front line, or on aircraft carriers at sea. Each outpost could have its own air strike capability on hand, as long as the aircraft does not need complicated maintenance procedures. Night and bad weather takeoffs and landings have been performed regularly in the field and present no serious problem.

Still, no one can say for certain what the future holds for military V/STOL. An aircraft's ability to operate from unprepared positions clearly gives it major tactical advantages, but forward strike aircraft will require logistic support and local security for effective operational use. If its history thus far is any indication, the Hawker Siddeley P.1127, as the first military operational V/STOL fighter, will successfully blaze the way for more advanced designs which are on the drawing boards today.

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Above allows for six separate paragraphs on each page.

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For double-line title	38
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Lord Tedder
A Man of Destiny

By Malcolm Miles

ON Friday, June 23rd, a very distinguished congregation, led by the representatives of Her Majesty the Queen, His Royal Highness The Duke of Edinburgh and other members of the Royal Family, assembled in Westminster Abbey to pay tribute to the memory of Marshal of the Royal Air Force the Lord Tedder, 1st Baron of Glenguin, Knight Grand Cross of the Order of the Bath. The heads of the three Services, of the civic and political life of the country, High Commissioners of the Commonwealth, and representatives of General Eisenhower, of the Royal Air Forces Association, of the Universities and of many other organisations and Associations joined men and women from all walks of life in this impressive service in memory of one of the outstanding leaders of Western forces in the Second World War.

Destiny had well equipped Lord Tedder for the great part he was to play, first in the Middle East and the Mediterranean and later as Deputy Supreme Commander to General Eisenhower in Europe, a famous partnership which led the way to ultimate victory.

Lord Tedder, the unassuming Commander with a twinkling eye and an impish humour, brought to all he did a great clarity of mind and facility of expression. His years commanding the Air Armament School and as Director of Training Air Ministry and later as Director-General, Research and Development gave him an unusually wide insight into the technical possibilities — and limitations — of the aircraft and the equipment of war which he was to command and direct with such skill. Above all, he brought to the conference table not a dominating personality, but a quiet questioning manner which took into account all points of view and a diplomacy which were to serve him well from the time he took high command in the Middle East where there was much conflict of opinion between the Services.

The ability, which did not escape the notice of Sir Winston Churchill, to balance the work of the three fighting services and to give air power its full opportunity of development whilst still being partners of the Navy and Army was, perhaps, his

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greatest contribution.

He upheld, and was vindicated by results, Lord Trenchard's fundamental theory of air warfare on which the Air Force was based. His contribution toward the perfecting of co-operation between land and air forces was inestimable.

Lord Tedder, who was born at Glenguin, Stirling, in 1890, was educated at the Whitgift School, Croydon, and at Magdalene College, Cambridge, where he read for the Historical Tripos. He was awarded the Prince Consort Prize, with the Navy as the subject of his essay in 1913. Years later he was busily opposed to any idea that the Air Force should fall into the embraces of the Navy or the Army.

In 1914 he entered the Colonial Service and on the outbreak of World War I was commissioned in the Dorsetshire Regiment — the beginning of his eventful and distinguished military career.

He served in France from 1915 to 1917 being seconded to the Royal Flying Corps in 1916. He fought as a pilot with No. 25 Squadron and he later commanded No. 70 Squadron on operations in France, during which time he was mentioned three times in despatches. He went to Egypt in 1918 and in 1919 he received a permanent Commission in the rank of Squadron Leader in the Royal Air Force, the Service he was never to leave until his death when he was the third senior Marshal of the Royal Air Force.

He commanded in succession No. 274 Squadron and No. 207 Squadron and it was whilst in command of this Squadron that he was ordered to Constantinople at the time of the Chanak crisis in 1922-23. On his return to England he qualified at the Royal Naval Staff College.

Subsequently Lord Tedder held a series of training appointments including command of No. 2 Flying Training School at Digby, service on the directing staff of the R.A.F. Staff College, command of the Armament Training School at Eastchurch, culminating in his appointment as Director of Training at the Air Ministry in 1936. He had taken the Imperial Defence College course in 1928.

His first major command was his appointment in 1936 as Air Officer Commanding Far East Command after which he returned to Air Ministry in 1938 as Director General of Research and Development.

It was in 1940, on his appointment as Deputy Air Officer Commanding-in-Chief Middle East, where feelings were running high on the question of the use of air power, that his particular gifts were to come into full play and his rapid rise to the highest command was established. He took over as Commander-in-Chief from Sir Arthur Longmore in 1941, was knighted in 1942, and became Air Commander-in-Chief Mediterranean Air Command in 1943. His famous partnership with General Eisenhower had now become a major force in the allied councils of war. It was during his commands in the Mediterranean that the great build-up of air power and its co-ordination with the Navy and the Army took place, leading to the final expulsion of the enemy from the African continent, the occupation of Sicily and the invasion of Italy.

Lord Tedder finally left the Mediterranean on his appointment as Deputy Supreme

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Commander of the Allied Expeditionary Force under General Eisenhower which was to mount "Operation Overlord," the greatest military operation the world has ever known and the European campaign which led to the final defeat of the enemy.

He became a Marshal of the Royal Air Force in 1946 and in the following year he was appointed Chief of the Air Staff in succession to Marshal of the Royal Air Force Lord Portal of Hungerford. He was created Lord Tedder, 1st Baron of Glenguin, in the same year.

Many appointments followed. He became an honorary Colonel, Royal Artillery in 1948, a Governor of the British Broadcasting Corporation on relinquishing his appointment as Chief of the Air Staff in 1950, Chairman of the British Joint Services Mission, Washington and United Kingdom representative on the standing group of the Military Committee of the North Atlantic Treaty Organisation, 1950-51, and Chancellor of his old University, Cambridge, in 1951. He was President of Standard Triumph International Ltd.

His consuming interest always remained the Royal Air Force which he served so well in war and in peace. Of his many appointments one which gave him particular pleasure was that of President of the Royal Air Forces Association. He became President in 1952, and with the exception of the years 1954-56 when he stood down in favour of His Royal Highness The Duke of Edinburgh, he held office until a few weeks before he died, when once again he stood down in favour of, as he put it, "my Royal predecessor." During his long Presidency he led the Association with great wisdom and followed its affairs with a deep personal interest. He counted among his happiest times his attendance at the Association's annual conferences, when he presided at the two-day business sessions with his customary skill and wit, and the many social functions which gave him an opportunity of meeting the rank and file of members, many of whom were proud to have served under him at one time or another and all of whom shared his pride in the Royal Air Force.

Although his long and distinguished life was crowned with honours, Lord Tedder in his personal life had known much sorrow. The first Lady Tedder, whom he had married in 1915, was killed in an air crash returning from a visit to a Royal Air Force hospital at Benghazi in 1943. One of his sons was killed on active service. The second Lady Tedder died suddenly in 1965.

Lord Tedder will be remembered with great affection and respect; for his leadership and love of the Royal Air Force; for his great contribution to the successful conduct of the Second World War; but perhaps most of all for being one of the most unassuming and approachable of men.

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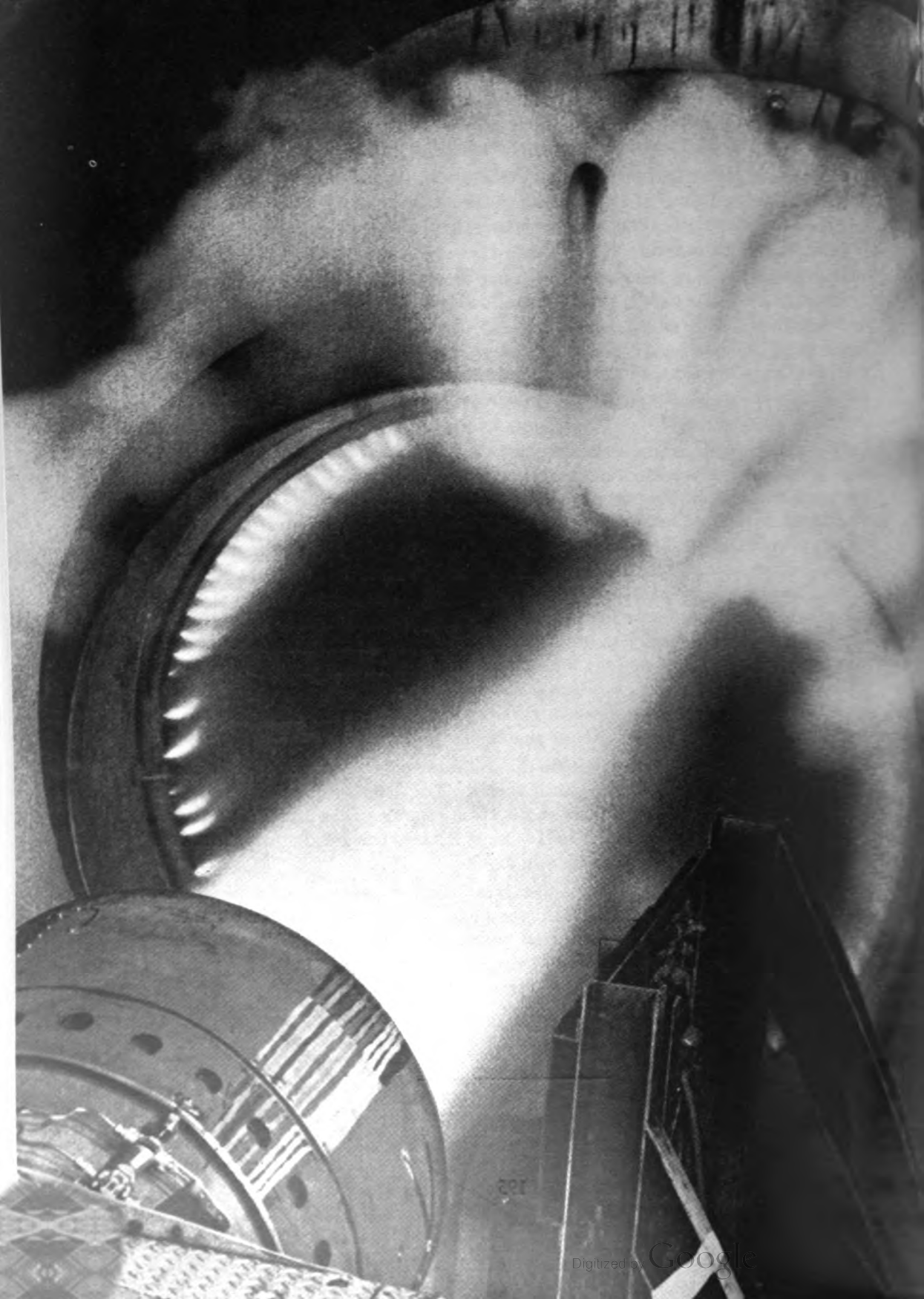
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War in the Middle East

By Dr. C. L. Wayper, M.A., Ph.D.

ONCE again in the recent Arab-Israeli war we have seen how determined the Great Powers are to avoid direct conflict. For some time the USSR has sought in the Middle East, an area of strategic significance on which the West has largely relied for its oil, to undermine what remains of Western influence and to remove what bases the West still maintains and it has even given the impression, which an admittedly volatile people was only too ready to receive, that it was committed to the cause of Arab nationalism to the point of upholding it in arms. Yet in the event it has shown clearly its conviction that the gains to be expected from its policy did not justify the risk of being involved in major war. And if its attitude did not suggest the imminence of Great Power war neither did that of the United States. It soon made it clear that it would take no part in the fighting, it was careful to keep in close touch with the USSR throughout the war, it showed every consideration for Soviet susceptibilities and made every allowance for the situation in which the Soviet leaders found themselves when their policy suffered its great set-back at the hands of the Israelis. This is not the manner of Great Powers when war between them is in the offing. And even if another arms race is begun in the Middle East that would not be, as the Economist would have us believe, the announcement of their determination to fight here next time but only of their decision not to agree this.

Once again, too, we have seen how unable the Great Powers are to prevent Small Power war. The USSR was not, it seems, consulted before the sending of Egyptian forces to Sharm El Sheikh, the action which made war extremely difficult to avoid and perhaps inevitable. And American and British attempts to dissuade Israel from fighting were of no avail from the moment when she decided that this was the only way in which her vital interests could be secured. The Great Powers could not command peace when Middle Eastern conditions made so evidently for war. The Arab states themselves were recent creations and as time had not yet made it clear whether Arab nationalism would be consolidated in them or in a single all-embracing Islamic community led by the strongest of them conflict between those who hoped for the one and those who longed for the other was still acute. Israel, too, was a recent creation and one which all Arabs had vowed to destroy. Not for them that old wisdom which enjoined a defeated state to restrain the natural thoughts of revenge which came to it in the day of its tribulation and to refrain from bending all its endeavours to destroy its former vanquisher. And not for Israel either that other piece of traditional wisdom that victory should not be too greatly exploited lest the great expansion of frontiers in victory invite their great contraction in subsequent defeat and lest by maximising passions war become more frequent than it need be. In circumstances

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such as these, even had they been united, the Great Powers could not have enforced peace although they might have ensured that acts of war would be restricted. But they were not united and their lack of unity made it impossible for them even to achieve this. And from the moment that an existing balance of power which had at least for the time frozen hostility by inhibiting its violent expression began to break down as a result of Soviet-Arab friendship, as that balance of power which held Kashmir in uneasy and malevolent peace broke down with the arrival of Chinese power on the Himalayas and the consequent coming together of China and Pakistan, the failure of the Great Powers to prevent war in the Middle East was as much to be expected as the failure of that war to involve themselves in fighting.

Here too in the Middle Eastern crisis we have seen how likely it is that war will break out in areas in which we have interests and how difficult it is when it does to protect them. We can be grateful to it if it helps us to follow Dr. Johnson's advice and clear our minds of cant, ridding ourselves as completely as General de Gaulle has done of the extraordinary view, with us for so long, that it is indecent to acknowledge the existence of interests and even more so to act to safeguard them. Perhaps one day we will say that Israel has done us all a service by making it clear that there can be forceful answers to forceful infringements of interests for only when this is understood are they likely to stop. It is no doubt a pity that this was not appreciated when after the second world war Britain was still trying to cope with the problem of Palestine, a pity that in the first Palestine became the 'twice promised' land. But if 'ifs and ands' were pots and pans there would be no trade not only for tinkers but also for Foreign Offices. We have to deal with the situation as it is, not as we would like it to be. And it is better that we should learn now than not at all the lesson that one cannot ride roughshod over the interests of others with impunity, better that we should know that we still have it in our power to hurt those who hurt us and that at the very least if peoples persist in cutting off their noses to spite their faces it is not for us, at considerable expense to ourselves, to provide the plastic surgery to stick them on again. We need not forget that it is still incumbent on the Great Powers to be more patient than the Small Powers. But we ought to remember that patience can degenerate into pusillanimity and that pusillanimity and policy are antithetic and not complementary terms.

The run of events in the Middle East may not have harmed us as much as we feared. With the all-embracing, unitary conception of Arab nationalism which Nasser embodied we could not come to terms. But that has been weakened by defeat and with the embodiment of that nationalism in individual states we can. But not without effort—effort to reduce our dependence on those who bear us ill-will, effort to remind those who do that there is a price to be paid for so doing, effort to help our friends, effort to avoid reducing disorder to chaos and granting it self-government prior to clearing out without further thought for the future, as once seemed to be our policy in Aden. With such effort, however, we might very well find, in the words of the Boiler Makers' Union and in the experience of the Israelis, that God helps those who help themselves.

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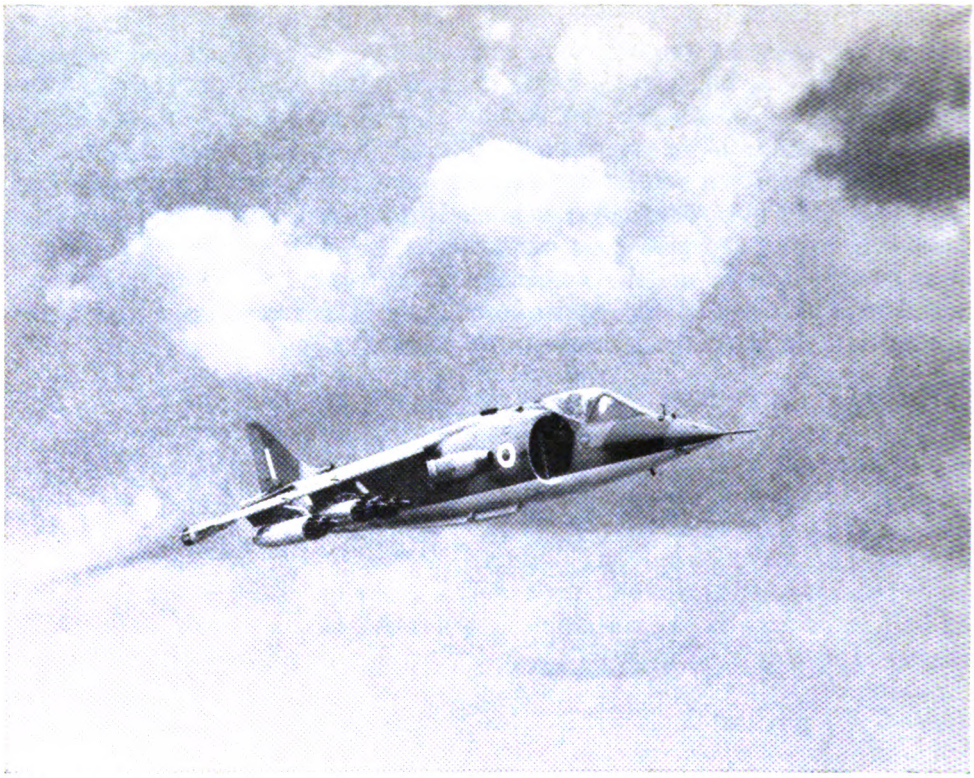

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LEADERSHIP WITH SPECIAL REFERENCE TO WORLD WAR II

By Air Vice-Marshal E. J. Kingston-McCloughry,
C.B., C.B.E., D.S.O., D.F.C., M.A. (Cantab.), R.A.F. (Ret.).

The Author has just completed his narrative of World War II. He was engaged before, during and after the Second World War upon planning War Organisation, in 1939 in the Office of the Director of War Organisation, as Head Air Operational Planner for "OVERLORD" and post-war was Chief Air Defence Officer at the Ministry of Defence.

In consequence he was frequently in the closest contact with the Architects of our Defence Plans and Supreme Commanders in our final victorious assault on the Germans.

He has very kindly granted "The Royal Air Forces Quarterly" the privilege of publishing a series of extracts from his new book. Many of our readers will have read his earlier books "Winged Warfare"; "War in Three Dimensions"; "The Direction of War"; "Global Strategy"; "Defence Policy"; "National Strategy"; "Defence" and "The Spectrum of Strategy".

For our series of extracts we have selected the last Chapter of his latest book, as being of special interest to our Service readers.

I

AT THE TOP

POLITICAL direction is very different from military direction though in both spheres the net result is a reflection of basic human qualities. So different are the claims of each sphere that only very rarely do they coalesce in one and the same person: the political and military spheres tend to remain in strictly watertight compartments.

A great many imponderables lie in wait for any leadership, whether it is political or military, but greatness here depends fundamentally on those elusive human qualities.

At the outset, and to avoid any hint of sacrilege which the non-mention of Churchill could create in certain minds, and also to clarify my own attitude to his role as our war leader in the Second World War, I must confess I am not wholly qualified to assess that role. However, from my own experience, I would unhesitatingly say that his effect as our political leader was tremendous though it is true that he became virtually a political dictator. Undoubtedly his courage, political skill and bulldog determination inspired the people of this country to continued hope and determination. On several notable occasions such as Dunkirk, the possible invasion of the United Kingdom, and the Battle of Britain, without any real military justification whatever Churchill made them believe they could resist effectively. Even my limited knowledge of the military scene did not suggest that any effective military resistance was possible at the time.

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Churchill's mandate as leader was made easy and clear for him and in this country at least it was roses all the way: to the people he could do nothing wrong. As the war proceeded, however, he found Roosevelt and his advisers increasingly difficult to deal with until Yalta, when Churchill lost dominance and a great deal of political control.

My appointments gave me a limited inside view of Churchill as a military leader. When he assumed control of the Ministry of Defence he constitutionally acquired a dictator role in all our military affairs as well. He endeavoured to exercise these powers as well to the limit of his capacity which included numbers of hare-brained and impractical schemes. Fortunately Field Marshal Brook, then C.I.G.S. and Marshal of R.A.F. Portal were outstandingly able and had sufficiently strong personalities to be able to resist Churchill's determination to have his own way. They were both invaluable aides to Churchill and gave him all the help they possibly could but they did not give way to ideas in which they did not believe.

In spite of this Churchill often made things difficult for the military machine and sometimes pressed on it schemes which were wildly impractical to say the least. It was also in keeping with his temperament that he had numerous quarrels and disagreements with the U.S. military leaders. He had an unhappy habit of referring to U.S. Generals, somewhat ungenerously and contemptuously, as Mr. instead of by the appropriate rank.

The dust of rhetoric will have to settle before it is widely accepted that Churchill had in many ways severe limitations. For long enough, for example, he was reluctant to agree to Overlord and when it was at last accepted he still hoped that the U.K. and U.S. strategic bomber forces would bring Germany to her knees and make the Overlord invasion unnecessary.

Of the two greatest of our Air Force leaders in the Second World War, Sir Wilfred Freeman and Marshal of the R.A.F. the Viscount Portal of Hungerford, there is paradoxically, least of all to say. Sir Wilfred was a great Air Force personality with all the qualities of a great leader. It so happened that his appointments as Chief Executive Officer in the Ministry of Aircraft Production and later as Vice Chief of Air Staff gave little scope for glamour and fame. Although senior to Portal, he was a big enough man to agree to become his deputy and he served him handsomely and loyally when Lord Portal was appointed Chief of Air Staff.

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Lord Portal is a good example of a service chief to whom the R.A.F. is profoundly indebted as is the country generally though less obviously and directly. With him the word leader is apt to seem a misnomer, though he was in fact an excellent leader: a man of action: a profound student of military affairs: quiet and courteous but with strong convictions and considerable firmness. He was most determined, even at golf, though there is also the apt illustration of how, while commanding a Bomber squadron which was competing for a prize, he took his place in the bomber crew as bomb aimer: his determination to secure the prize resulted in every effort in training and his crew did in fact win the prize.

He was of a calm temperament and could not be easily upset, was able and highly intelligent and had an outstanding knowledge of the Service in all its aspects. He was also highly literate, a rare quality among air force officers but it stood him in good stead through the war years when he was compelled to write minutes often against time. He was curiously diffident for a man of such distinct gifts and it was in character that he should be a lone man. Throughout the war years he tended in leisure moments or what there was of it, to seek isolation, seeming to relax and restore his energies better in that way. There were occasions of course when he relaxed even this tendency, and no one knew him better than did Freeman. These two had a standing arrangement to dine together once a week, usually in the Grill at the Carlton.

He enjoyed an immense prestige in British military and civil councils as well as among the senior American officers of the Allied Command. His achievements were not glamorous and did not lead to popular acclaim or lend themselves to spectacular description, but he deeply influenced the fate of this country by his direction of the R.A.F. and his influence in the councils of the Chiefs of Staff. Here he dominated a singularly strong group and there was no other air force officer at the time who could have surpassed him in these duties. Although Alanbrooke was chairman of the Chiefs of Staff and often takes great credit thereby, Portal's authority was paramount in dealing with Churchill in the realm of strategy and the conduct of the war.

He was aware of the esteem with which both British and American political and military leaders regarded him and he used it to maintain harmony where otherwise there might have been severe strain and even open breach. The exceptions among his admirers were the Bomber chiefs, Harris of Bomber Command and Spaatz of the VIII U.S.A.F., who did not always make it easy for Portal; and he may have occasionally leaned over backwards to maintain harmony. Yet as a war-time C.A.S. he was well-nigh ideal, and there was no one with whom he would not deal adequately and crisply. He concerned himself with the right things in the right way which is of far greater importance and a greater gift than merely being methodical.

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II

MARSHAL OF THE R.A.F. LORD TEDDER

I have already outlined the emergence of Lord Tedder as a national military leader in Overlord where I was in frequent and close contact with him in the planning and later stages. Lord Tedder is a difficult character to analyse and assess. Naturally shy and reserved, with a high-pitched voice, no more than ordinary as a pilot, he had established himself in the Royal Air Force itself, and was in general an unspectacular officer right up to the beginning of the Second World War.

Nevertheless, he had many latent qualities including outstanding mental ability, and the Second World War gave him the opportunity to develop them. He began to show his mettle from the very beginning of the war as Director General of Research and Development at the Air Ministry. In those critical days when operations soon proved the inadequacy of our bombers, bombs, weapons and other equipment, Tedder played an important part in shaping future programmes. Indeed, he must be praised for his imagination, courage and persistence in ordering a new family of bombers and bombs which could not be in service for several years. He insisted on this action rather than on taking the easy course of merely tinkering with current designs.

From the outset of the Second World War, Lord Tedder's personality became very marked. He outclassed most of his contemporaries as a scholar and with the wisdom acquired from reading. At that time it was the capacity for handling administrative and technical rather than operational problems which was his metier. But above all this it soon became clear that Lord Tedder had original ideas, that he could see essentials and had a practical grasp of the problems confronting him. His most outstanding quality was that he did not allow himself to be bound by custom, accepted doctrines or red tape, and was unruffled in emergency and forthright in debate or discussion.

He had none of the exhibitionism of Montgomery or Patton and the striking and estimable qualities of great leadership which he undoubtedly had were an inspiration to his immediate staff but they had relatively little impact on his airmen. His personal approach found expression in a facade of sarcasm, mocking wit and irony. Valuable as it might have been in the heat of active service this technique was less effective in the days that followed.

There appear to be four main reasons for Lord Tedder's success. He was intelligent and had common sense, and was outstanding as a great fighter in argument and in high level conferences; he was a real apostle of air power; he had the breadth of view and the capacity to capture the confidence of the Navy and the Army: he also had the very British qualities with which the Americans could work even if they could not understand them – diplomacy, intelligence, a knowledge of when to compromise, absence of formality and pomp, and an uncanny ability to talk with sailors, soldiers, scientists and Americans in their own language.

After his outstanding work in the Directorate of Research and Development,

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Lord Tedder got his chance when Air Marshal Boyd was taken prisoner at Sicily while en route to the Middle East to take over as Deputy Commander-in-Chief. It was from then that Tedder's star began to rise.

When Lord Tedder arrived in the Middle East, first as Deputy, and then Air Commander-in-Chief, he was under much pressure from the Navy and the Army to give air support as they always understood it, which meant maximum direct air support for every manoeuvre or operation in which the Navy and Army were involved. With very limited air forces, Lord Tedder refused to dissipate them in the penny packages the older Services were demanding. Although it may seem a platitude to mention the paramount importance of keeping air forces flexible, at that time the Navy and Army were each pressing for a fixed and rigid allocation for themselves. At the critical times Tedder saw the attack against Rommel's lines of communication as the basic role of the Air Force, with support to the Navy and the Army not when they were merely preparing or manoeuvring but only when they were fighting decisive battles. Moreover, praise must be given to Lord Tedder for creating a new spirit and a new technique of co-operating with the other Services. As the Middle East campaign developed and the lessons of our catastrophes in Greece, Crete, and other operations became apparent, Tedder lost no opportunity of bringing the new conditions of modern war to the notice of all concerned. We must add to this his contribution to the overall conception, the planning and organization of the war in the Middle East and Mediterranean. He was among the first senior officers who were not above seeking the advice of scientists in the formulation and execution of his plans.

Having enhanced his status and created a reputation and, above all, won the confidence of Eisenhower and other American leaders in the Mediterranean, Lord Tedder was well placed for his subsequent appointments as Air C.-in-C. Allied Air Forces in the Mediterranean theatre under Eisenhower and later as Deputy Supreme Commander for the invasion of France. Nothing contributed more to the success of 'Overlord' than the mutual confidence between Eisenhower and Tedder, together they placed Anglo-American co-operation and good relations above all else. Sometimes these were severely tested; in particular during the controversy at the highest level over the balance of effort the Allied bomber forces should give to direct support of 'Overlord' and indirect support of attacking the German war potential direct.

With all these qualities and a brilliant war record, it is disappointing that Lord Tedder's term of office as the first post-war Chief of Air Staff should lack apparent distinction. There is no doubt that the early phases of the run-down of the Royal Air Force brought diminished prestige to it, and less spontaneous recognition of its demand, perhaps unavoidably.

Few would question that Lord Trenchard is the greatest personality, though by no means the greatest intellectual of the R.A.F., and he made the biggest impression on the Service. Lord Tedder on the other hand was perhaps the R.A.F.'s greatest intellectual yet because of a variety of circumstances left relatively little mark though he well deserved national acclaim.

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III

SIR TRAFFORD LEIGH-MALLORY

In A.E.A.F. I was in constant touch with the C-in-C. Air Chief Marshal Sir Trafford Leigh-Mallory and as the assault proceeded I was delegated a variety of tasks by him. Apart from Lord Tedder, he was the other U.K. air leader most concerned in Overlord, yet possibly he had more critics than admirers amongst his colleagues than any other senior R.A.F. officer. Nevertheless, he was a great personality who had given years of service to a close and careful study of tactical air warfare; and it was primarily because of his extensive experience in the army support and fighter roles that he gained the appointment as Air Commander-in-Chief of 'Overlord'. On the other hand, it was for this very reason that the 'Bomber Barons' were so critical of him.

Certainly it was unfortunate that Leigh-Mallory was thrust into a position at high level where he was very closely concerned with the employment of both British and American air forces without previously, and at a less critical time, having the opportunity of getting to know the American Air chiefs and also the leading American Army Generals. It was the more unfortunate that Leigh-Mallory was aloof, even with his own staff, and had a pompous manner which the Americans associate with the type of English they most dislike, but in his case it was a nervous self-defence rather than pomp or conceit. Also, with his outstanding honesty which did not allow him to finesse or manoeuvre, he experienced some difficulty in dealing with many American and British senior officers.

It is difficult to ascertain whether Leigh-Mallory's failure to attain comparable status and acclaim with his fellow Cs-in-C from his own country and the U.S. was because of his inherent shyness or sense of inferiority masked by an aloofness, or because of some more serious lack in his character. He was ambitious enough but seemed to lack sufficient self-confidence essential to the personality of a great leader. There can be no question of his professional ability but greatness requires the ability to ride on top of the petty acrimony and squabbles which in those days were far too numerous and emanated from people who should have known better.

He was definitely inclined to take up this minor kind of challenge and become embroiled in quarrels and intrigue not entirely of his own making. The difficulty he experienced in getting above relatively minor disputes might have made him unfitted for the fiercer, broader and more vital issues at a higher level.

An example of this kind of situation was during the Battle of Britain when he commanded 12 Group and Keith Park commanded 11 Group. The complaint against him is on a matter of tactics: and the wisdom of concentrating on bringing down Huns

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rather than in protection of the northern air fields may be a debatable issue: there is, however, no evidence that 11 Group suffered directly as a consequence of this particular tactic. It is not inconceivable that both Leigh-Mallory and his second, Bader were moved by a not unnatural desire to get into the act, perhaps from different motives, Leigh-Mallory from personal ambition and Bader from fighting spirit. It is possible that from this point a feeling of distrust affected his career on the part of those who had to deal with him: a feeling for which I am certain many must have found there was no real basis.

It is no reflection in the slightest on Portal who selected him for A.E.A.F. thinking the job would be no more than extension of his Fighter Command duties over the beaches of Normandy. At that time Portal in common with many others had no idea of the amount of heavy bomber support with which A.E.A.F. would become involved. That he matured with the growing responsibilities that were assigned him as Commander-in-Chief A.E.A.F. there can be no doubt.

IV

SIR ARTHUR HARRIS, Bt.

Throughout Overlord in common with others at Staff level in the R.A.F. I was in touch with or rather saw the influence, and certainly felt the reverberations of the command of Air Chief Marshal Harris.

Whatever the verdict of history, Air Chief Marshal Harris's views on 'Overlord' at the time must be respected. It was, however, regrettable that during the planning days the Bomber Command C-in-C was so hostile to Leigh-Mallory's scientific adviser, Professor Zuckerman. The hostility centred round the employment of strategic bombers and bomb damage. Except from photographs, Air Chief Marshal Harris had not seen the damage caused by any of his bombing and Zuckerman, on the other hand, had made a close and scientific study on the spot. But Harris would not admit that anyone knew more about bombing and bomb damage than he did himself. And despite the many opportunities he had after V.E. day he never once inspected the bomb damage and havoc he had wrought to Germany and her many large cities. If Air Chief Marshal Harris had a real limitation, it was his great reluctance to accept a strategy of a flexibility which Tedder had learnt and applied in the Mediterranean, of switching bombers to the most profitable roles and targets during the varying phases of the war. Doubtless the real difficulty was that to Air Chief Marshal Harris there was only one profitable system of target from the beginning to the end of the war. Notwithstanding the foregoing, once the 'Overlord' plan was accepted and the 'Bomber Barons' rearguard actions lost, Sir Arthur Harris

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gave the fullest support to 'Overlord'.

The Commander-in-Chief, Bomber Command, had to maintain a policy which exacted the loss of a very large number of aircrew composed of the cream of the nation. Air Chief Marshal Harris certainly did not flinch at the cost his crews had to pay for his policy, which he pressed at a tempo even beyond that expected in some quarters. In the event, he gained a reputation for toughness and forthrightness, and it became known that the penalty for what was deemed failure or shortcoming was swift and final. Of modern military leaders, Harris came nearest to Wellington in his blunt and terse letters criticizing policy, methods and actions. All this became possible to Harris because of the direct entree he had managed to establish with Sir Winston Churchill. Nevertheless, in some difficult circumstances the Air Staff maintained its authority and orthodox procedure prevailed.

Harris rarely visited units so that he could scarcely have shown the traditional attributes of leadership, personal toughness in the field and an outstanding personality which could have encouraged his forces to make the vast sacrifices which they did make. Quite apart from the soundness or otherwise of his doctrines, his qualities of leadership were extraordinary.

Throughout the bomber operations against Germany Harris was the only C.-in-Chief in Bomber Command so that there is no one else with whom he might be compared. He certainly did the job that had to be done, better than any other R.A.F. officer of that time would have done. He certainly got the maximum amount of national effort in man-power and material for his Command, and from that Command he exacted the maximum possible number of sorties.

His entree to the Prime Minister at that time mainly through Lord Cherwell but also because of Churchill's specific concern in the bombing of Germany and his belief that it would bring the German people to their knees, gave Harris the power to bully and often to dictate to the Air Ministry. Apart from operations any decision by Harris to sack, promote or decorate an officer was never challenged by the Ministry. Thus much of his power and the loyalty of his whole Command hinged on this unequivocal ability to sack, or to give and take away the acting rank of many of his officers: also his ability to influence the award of honours and to discredit or disgrace any of his personnel was much feared. Thus a genuine fear of the power he wielded rather than popularity, admiration or any exaltation extended from his Deputy at Bomber Command H.Q. down through the Group H.Q.s to all the officers in his Command.

He did much to deceive his Command with regard to the actual effectiveness of their bombing. They really believed that they were fast defeating the Germans at home, and indeed, winning the war by themselves. Had the real truth of the ineffectiveness of their bombing become known to them there would have been a serious danger of mutiny. It may be true that to some extent Harris was misled himself, but he was aware for sometime that the bombs were going far wide yet he resisted independent investigation of this failure to hit the targets intended.

We first met at the Army Staff College, Camberley; and he was always given to

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teasing the Army and Navy about their absurd obsolescence. This teasing, however good-humoured, was the reflection of a real belief which he held before and during the Second World War. He was somewhat above the average intelligence characteristic of the R.A.F. officer of his day, though he could scarcely be said to approach the intellectual standard of a man like Tedder.

For an officer who was to hold such a responsible command he did not enjoy the respect of the senior officers in the Army or Navy or those in the U.S. Army or Navy as well as many of those more nearly associated with him in the U.S.A.F. He had the quality of single-mindedness but it is not easy to determine how much of this mind was the result of deeply considered policy and how much was his inability to examine critically the aims and results of that policy. The tendency to bully in his character became more pronounced as he became more established and felt more secure as C-in-C Bomber Command.

V

ADMIRAL RAMSAY

Of our naval leaders, Admiral Ramsay and Admiral Mountbatten are the two of whom I have most personal knowledge. Admiral Ramsay was a retired officer recalled early in the war and was in command of the naval operations concerned with the evacuation at Dunkirk. Later, Admiral Ramsay was appointed naval Commander-in-Chief for 'Overlord'. Indeed, he was probably the best choice of all our Admirals at that time from the point of view of our own naval affairs and also from the inter-service and inter-allied aspects.

Admiral Ramsay was a man of great charm, tact and courage. He had a thorough knowledge of naval strategy and tactics and also of the problems, potentialities and limitations of the British and the Allied Army and Air Forces. He had great wisdom and powers of persuasion and carried much weight in conference and at the national and inter-national council tables. Although he always pressed for the naval requirements, in inter-service affairs he was quick to appreciate the general problems and to concede to the other Services accordingly. Although determined in the execution of operations, he was generous, particularly with the other two services when failure occurred from misfortune rather than from folly. Certainly Admiral Ramsay was one of our foremost naval leaders of the Second War.

(The views expressed in this Journal are those of the Authors and are not to be construed as official opinions or policies—EDITOR)

(A further series will be published in the 1968 "Spring" and "Summer" numbers of the Journal.— Editor)

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THE CHANGING PATTERN OF DEFENCE

By Air Vice-Marshal W. M. Yool, C.B., C.B.E.

NEW defence policies tend soon to be forgotten but it is worth remembering that the various major changes made since the war have followed a remarkably consistent pattern irrespective of the political colour of the Government in power. Nor has "stop-go" been confined to the economic front; it has also been applied in the defence field, but the other way round. "Go-stop" has been the order of the day.

The first "go" occurred under the Labour Government during the Korean War, when, following the post-war run-down of the armed forces, a re-armament plan costing £4700m. over three years was launched. By the time the Conservative Government came to office in October, 1951, it had become clear that a programme of this magnitude was in fact beyond the economic resources of the country at the time and at the end of 1952 the programme, which had already fallen behindhand, was further slowed down and greatly reduced.

Nevertheless defence expenditure continued to rise over the next few years and the brake was applied once more in 1957. The outline of future policy published in the 1957 Defence White Paper (Cmd. 124) introduced some of the most far reaching and fundamental changes ever made in British defence policy in peacetime. The measures then adopted included the ending of national service by 1962 and the stabilising of the armed forces on an all-regular footing at a strength of 375,000 by the end of that year.

But the most fundamental decision of all was that the main plank in Britain's defence was to be the nuclear deterrent, operated mainly by the V-bomber force but supplemented in the early years by American intermediate-range Thor missiles. Two other decisions fundamentally affected the future role and equipment of the Royal Air Force; (a) having regard to the high performance and potentialities of the Vulcan and Victor medium bombers and the likely progress of ballistic rockets and missile defence the Government decided not to go on with the development of a supersonic manned bomber, which could not be brought into service in much under ten years and (b), in view of the progress being made in the development of ground-to-air anti-aircraft missile defence the Government decided that the R.A.F. was unlikely to have a requirement for fighter aircraft of types more advanced than the supersonic P.1 (Lightning) and that work on such projects should stop.

At the same time, because a nuclear war would inevitably be catastrophic and short and there was therefore no requirement for the type of reserve forces necessary to support a long-drawn out conventional war, the Royal Auxiliary Air Force and the Royal Naval Volunteer Reserve squadrons were disbanded and

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the Territorial Army was to be reduced and re-organised, although in the event the major reductions and alterations in the role of the latter force did not take place until 1966.

When the 1957 Defence White Paper was published there was a storm of criticism and it was widely hailed, for instance, as marking the end of the R.A.F. If there were to be no more bombers or fighters would the force have any worth while role in the future? Actually, however, the 1957 decisions have stood the test of time admirably. Ten years later, although modified in minor ways, British defence policy is still based in the main on the 1957 decisions.

In spite of the extent of the 1957 "stop" defence expenditure once more started to build up, and before the Labour Government came to power again in 1964 they had announced that they intended, if returned, to make substantial reductions in defence expenditure and that, in particular, various aircraft projects then in the development stage would be reviewed and probably abandoned. In addition they announced that they intended to abolish the British nuclear deterrent when the V-bombers were phased out in the early 70's and that the five Polaris submarines would be scrapped unless the progress made in their construction made it uneconomical so to do.

When the Labour Government was returned they cancelled the TSR 2 strike-reconnaissance aircraft, the P.1154 supersonic VTOL fighter and the HS 681, the V/STOL support transport aircraft, and in their place have bought American aircraft for present needs, and are collaborating with France on the development of the Jaguar and a variable geometry aircraft to meet our requirements in the middle and late 70's. The position in regard to the nuclear deterrent, however, except for the cancellation of one of the five Polaris submarines, remains the same as under the previous Government. A proposal for an Atlantic Nuclear Force was put forward but this made no more progress than the abortive American proposal for a Multilateral Force of surface ships armed with nuclear missiles, first put forward as long ago as 1959 and discussed interminably ever since.

The next landmark in defence after 1957 came with the 1966 Defence Review (Cmd. 2901), in which these various decisions were announced. Once more "stop" was the watchword. Defence was to be stabilised (significantly, not reduced) by 1970 at £2000m. per annum at 1964 prices. Although the R.A.F. was materially affected by the 1966 Review the changes were comparatively minor compared with those affecting the other two services. By and large the changes affecting the R.A.F. were confined to the substitution of American aircraft for previously planned British aircraft. These are political decisions rather than military ones and do not fundamentally affect the ability of the R.A.F. to fulfil its roles, however much one may regret the consequent decline of the British aerospace industry.

The Army, however, was materially affected by the reorganisation of the reserve forces. Under the previous Government some reductions had been made in the Territorial Army but the reorganisation which was put into effect on April 1, 1967, and which had been announced in a White Paper, "The Reorganisation of the Army Reserves" (Cmd. 2855), went much farther. Not only was the strength con-

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siderably reduced but the main role of the reserve forces is no longer the reinforcement of the regular army in the event of a long drawn out conventional war but is now confined to the provision of individuals and/or specialised units for the short-term reinforcement of the British Army of the Rhine and elsewhere overseas. In addition there are a number of home defence units intended primarily for the support of the civil authorities in the event of nuclear attack.

This reduction in the role of the reserve forces follows logically from the 1957 Defence White Paper, when Britain first decided to base her defence primarily upon the nuclear deterrent. This was reaffirmed in the 1966 Defence Review, which stated, "On the other hand, once nuclear weapons were employed in Europe, on however limited a scale, it is almost certain that, unless the aggressor quickly decided to stop fighting, the conflict would escalate rapidly to a general nuclear exchange, in which the whole of America's nuclear forces would be engaged. We have, therefore, urged on the alliance that it should abandon those military preparations which rest on the assumption that a general war in Europe should last several months."

The major decision in the 1966 Review affected the Navy most of all, namely: "The present carrier force will continue well into the 1970's; but we shall not build a new carrier (CVA 01)." This decision led to much controversy and to the resignation, for somewhat different reasons, of the Minister of Defence for the Navy and the First Sea Lord. There seems no doubt that the Government's decision on this issue was basically right. A new carrier could not be in commission before the mid-70's and it is not a question of only one carrier. To ensure having a carrier permanently on station at least three would be required. Then, a carrier is an expensive and inefficient method of operating aircraft. Technical developments in the operation of aircraft make it likely that even in the United States, where there is a powerful Navy lobby, the carrier will have vanished from the oceans of the world by the late 70's as the battleship vanished after the Second World War.

Even if a case could be made out for the carrier on sound operational grounds there is a definite limit to what this country can afford to spend on defence and the 1957 and 1966 "stop" decisions were undoubtedly basically right. The TSR 2 is another case in point. It had been obvious for two or three years before the final decision was taken to abandon this aircraft that the development costs were getting out of hand. Britain can no longer afford grandiose defence projects and even the United States, with its almost limitless purse, is hesitating over the astronomical cost of an anti-missile defence system, although admittedly their hesitations are due partly to doubts as to the efficacy of the system as well as its eventual cost.

In common with the other services the Navy's role has also been altered by the nuclear deterrent policy and the 1966 Review stressed the fact that "it is no longer realistic for the Alliance to attempt to provide maritime forces for conducting a long war at sea after a strategic nuclear exchange. Deterrence must be the first purpose of N.A.T.O.'s naval forces too." Apart from the operation of the Polaris submarines, which will be the primary role of the Navy in the future, its secondary roles are now those of anti-submarine warfare and the provision of amphibious support in limited war.

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Although there are differences between the two main political parties on details of defence policy, basically both are agreed on Britain's defence policy being based primarily on the nuclear deterrent, and that, should a major war occur, it will inevitably result in an all-out nuclear exchange. From this it follows that, once provision has been made for the operation of the nuclear deterrent, at present by the nuclear bomber force and later by the Polaris type submarines, the roles of the remainder of the armed forces are the secondary ones of acting as a trip-wire in Europe to identify major aggression and of being prepared to fight limited wars in any part of the world, either at the invitation of some country with whom we have a defence agreement or as part of a United Nations force.

This policy was laid down in the 1966 Review, which said, "First, Britain will not undertake major operations of war except in co-operation with allies. Secondly, we will not accept an obligation to provide another country with military assistance unless it is prepared to provide us with the facilities we need to make such assistance effective in time."

Obviously such a policy cannot be fully implemented as long as Britain has defence responsibilities of her own overseas. The process of gradual withdrawal from and the granting of independence to our former colonial empire started in 1947 with the granting of independence to India and Pakistan. This process has continued ever since irrespective of the party in power and the present Labour Government is only carrying out the final tidying up of a policy which has been followed steadily during the last twenty years. In spite of the present unrest in Aden it seems certain that our final withdrawal from there cannot be long delayed and although we are committed to maintaining a presence in the Persian Gulf for the moment it is only a matter of time before we also leave that area. Singapore is next on the list and here again there seems to be no political justification for maintaining British forces there indefinitely. Unfortunately, some of the proposals for withdrawals are bedevilled by politics, as we have found to our cost in Malta. Similarly our continued presence in Singapore has been due partly to pressure from the United States, in spite of their anti-colonial prejudices, to remain there and partly to the local Government's fear of the economic consequences of withdrawal.

Sooner or later however we can look forward to a situation in which our only bases or staging posts overseas will be on territory which is free from local political pressure and either under the direct control of the British Government, as in Gan and Aldabra, or in a country, such as Australia, where we should not be the unwelcome guests we have become in so many other areas.

What will be the shape of the British armed forces in say ten years' time when all the withdrawals and alterations in policy have been put fully into effect? The Army, reduced in numbers to about 150,000 men, will be based almost entirely in Britain and Germany and organised on a highly mobile basis. The Royal Air Force, once the V-bombers have been phased out, will no longer have the primary role in defence but will have the secondary role of providing tactical support for the other services, and the necessary strategical and tactical air transport required to enable the three services to be moved rapidly to any threatened area in an emergency.

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The importance of aircraft in major wars has been much reduced in recent years by the advent of the missile. In the United States the strategic bomber has been largely replaced by the inter-continental ballistic missile and the Polaris submarine and the V-bombers are being replaced in this country by the Polaris submarine. At the same time the interceptor fighter has been almost entirely replaced by the anti-aircraft missile in those countries where it has been possible to set up a sophisticated air defence system. In addition tactical aircraft are being partially replaced by the tactical missile, of the Mace, Pershing and Sergeant type, and all these various developments have tended to lessen the importance of aircraft in major war, a trend which will continue during the years ahead.

This does not apply to the same extent to limited war, where the tactical support aircraft would appear to have a major part to play for as far ahead as can be foreseen. But even in limited wars missiles are taking over from aircraft to some extent. In North Vietnam, for instance, the anti-aircraft missile defence has greatly influenced American tactics in attacking targets there and seaborne missiles may be used to attack some of the more strongly defended targets. There have also been reports of the North Vietnamese being supplied with Russian medium-range missiles for the attack of targets in South Vietnam.

In the ten years under consideration the Navy, with the four Polaris submarines, will have fully taken over the nuclear deterrent role from the R.A.F. This is not, however, a normal naval function. The V-bombers, in addition to the nuclear role, can also be used in the conventional role and have been so used on several occasions, as the American B.52's have been in Vietnam. The Polaris submarines, the first of which is expected to commission in the spring of 1968, on the other hand have no alternative role and are purely launching platforms for their ballistic missiles. It may be that in the years ahead Britain may find it necessary, in order to maintain the nuclear deterrent in being, to turn again to land-based missiles. The American Minuteman missile, in fully protected silos, is a possible replacement weapon for the future. France, which is assuming the major role in West European defence regarded as a whole, is developing both submarine and land-based nuclear delivery systems in addition to the existing nuclear bomber force.

Once the aircraft carriers have been phased out the Navy's main roles, apart from the operation of the Polaris submarines, will be to provide amphibious forces for the support of the Army and anti-submarine forces. The Navy will no longer be equipped to fight a prolonged war at sea on conventional lines.

During the period under review the process of integration and unification in the Ministry of Defence will undoubtedly have proceeded still further but whether the Canadian system of integrated inter-service commands and a unified service combining all three services will eventually be adopted in this country is much more doubtful. It is certain however that there will be increasing pressure in the years ahead for the services to be integrated but whether this will come about depends to some extent on the size of the armed forces. Canada's armed forces only total about 100,000 in all and it is probably uneconomic to maintain separate services

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with such small numbers. Britain's forces total some 445,000 (including 27,000 enlisted outside the U.K.) at present and even with the reductions now in prospect it seems unlikely that the total will fall much below 350,000 in ten years' time. With these numbers integration would not necessarily be an economic proposition, apart from all the other complex factors which would affect such a decision.

The greatest change in the pattern of defence in history has arisen from the invention of nuclear weapons. These have altered the whole conception of warfare, in spite of the assertions of those who regard a nuclear warhead as only a bigger bang. In the United States, during the discussion on whether or not to attempt to provide an anti-missile defence, figures of 50 to 75 million casualties as a minimum arising from an all-out nuclear attack are freely quoted. No country could stand up to casualties on this scale and still attempt to continue the war. All the efforts of those left alive and uninjured would have to be concentrated on their own survival and on starting to clear up the widespread devastation.

The threat posed by a nuclear holocaust is the great safeguard provided by the nuclear deterrent and paradoxically therefore the nuclear deterrent is the greatest peace-keeping device yet invented. Without nuclear weapons there would almost certainly have been another major war in Europe before now and the statement in the 1967 Defence White Paper "that tension in Europe has relaxed and that there is little danger of aggression at present" is probably correct, but this is partly due to the existence of the British and French nuclear forces. When the United States had a monopoly of long-range nuclear missiles the massive retaliation policy of Mr. Dulles held the field. Now however that the Soviet Union has developed its own long-range missile threat to the American homeland the policy of flexible response has replaced that of massive retaliation, but no one knows how flexible the response would be in case of need. This uncertainty led France to develop her own nuclear weapons and to withdraw her forces from N.A.T.O., because the French fear, with reason, that Europe might be over-run whilst the Americans are making up their minds on what their response should be to any Soviet aggression. So long as the United States cannot be relied upon to come promptly in all circumstances to the assistance of Western Europe with her strategic nuclear forces, and obviously she could never give such an undertaking, because the first duty of a President is the security of his own country, peace in Europe will depend upon the British and French nuclear forces. Should either or both ever discard their nuclear shields Europe would be in grave danger. Sooner or later, if Western European defence is to stand on its own feet instead of relying to a large extent on the United States, there will have to be a unified defence system to supersede N.A.T.O., and the first requirement for this will be the integration of the British and French nuclear forces.

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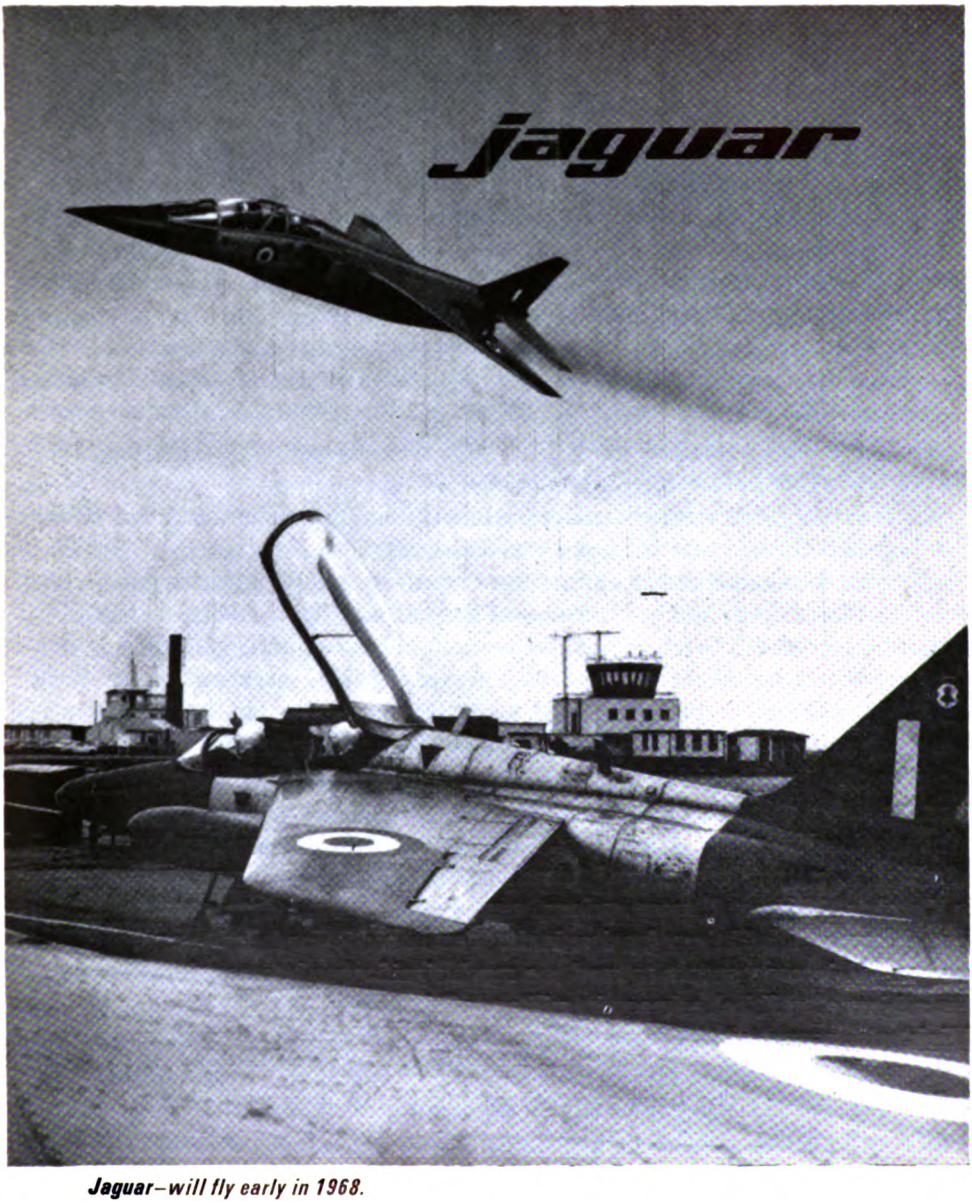

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THE SOVIET ARMY LOOKS AHEAD

By Wing Commander J. F. L. Long, M.A., R.A.F. (Retd.)

AT the time of writing, more than two months have elapsed since TASS brought the guessing game about the identity of Marshal Malinovsky's successor to an end in a lengthy announcement.[1] It was not, after all, to be the civilian Dmitry Ustinov, a secretary of the CPSU Central Committee and a former Minister of the Defence Industry, nor, among the other top echelon appointments announced at the same time, did the much fancied name of Marshal Krylov, commander-in-chief of the Strategic Missile Forces since 1963, appear as a First Deputy Minister of Defence. Among kremlinologists, both men had been attracting attention, but, once again, the crystal ball analyses somehow went awry.

The choice of the Soviet political leadership for Minister of Defence fell on 63-year old Marshal Grechko, as most middle-of-the-road pundits expected. Grechko's claims were formidable and could not have been very easily ignored. Malinovsky's No. 2 as First Deputy Minister for almost a decade and commander-in-chief of the Warsaw Pact forces, Grechko well understands the *modus operandi* of the job of chief representative of the military establishment in the highest political circles in the USSR, although on balance he may turn out to be somewhat less pliable than his late master. To pass him over would have been tantamount to dismissing him, but the risks of doing this, if they were ever assessed by the political leaders (which seems most unlikely), were plainly too great. It would have meant, in effect, an end of the easy relationship which appears to have been built up by the Brezhnev-Kosygin administration and the military leaders since Khrushchev was removed from office in October, 1964, and, more serious, would have aroused deep suspicions in the armed forces. The Ustinov fanciers in the West in particular failed to appreciate this and tended in consequence to read too much significance into certain assertions on the subject of political primacy in military affairs which were made in the Defence Ministry's newspaper, *Krasnaya Zvezda*, just before the appointments were announced. Interesting though these references were in other ways, it is hard to believe that they had anything to do with Ustinov's candidature.

Of much greater significance than the appointment of Grechko is the emergence of Marshal I. I. Yakubovsky and Army General S. L. Sokolov as First Deputy Ministers of Defence (making three in all, with the aging Marshal Zakharov) and of Army General I. G. Pavlovsky one step below as a Deputy Minister. These three officers have been elevated to the top military echelon from commanding military districts and none, apart from Sokolov, has recent service at or near the centre to his credit. For this reason primarily only a tiny majority of private strategists hedged their bets with warnings of this possibility, although official Intelligence guesses may have been better.

(1) TASS, April 12, 1967.

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The latest promotions, taken in conjunction with the replacement of Marshal Sudets in the autumn of 1966 by Army General P. F. Batitsky as Commander-in-Chief of the Air Defence Forces suggest that a stiffish breeze of change is now blowing down the corridors of military power in Moscow. All three new deputies belong to the generation of soldiers who, like Batitsky, joined the Communist party during or just after the Red Army purges in 1937 - 38. Yakubovsky and Sokolov became members in 1937, Pavlovsky in 1939. Almost 30 years later, in an order of precedence corresponding precisely to their new military ranks, they were elected at the 23rd CPSU Congress of April, 1966, to the CPSU Central Committee or Auditing Commission (Yakubovsky as Central Committee member, Sokolov as candidate member and Pavlovsky as member of the Auditing Commission). This may be taken as a clear sign that the high fliers had been picked out long before Malinovsky's illness became serious and with his approval.

The first phase in the rejuvenation of the Red Army's leadership is now approaching its end and will be complete when the consequential changes in the military districts become known. The pointers so far indicate that the day of the wartime marshals is at last over and that the follow-on generation of soldiers is now reaching the topmost positions in Russia—more than ten years later than their counterparts in the West. The new deputy ministers are comparatively young by Russian standards —their average age is only 55. The time cannot be long delayed before at least four elderly marshals, with an average age of 68 and some 30 years' service between them at the top, are retired. These are Marshals Zakharov (Chief of the General Staff), Chuikov (civil defence chief), Bagramyan (chief of the rear services) and Vershinin (C.-in-C., Soviet Air Force).

Some private strategists on this side of the Atlantic have seen considerable significance in the political implications of the appointments on the same day of a military commander from a Ukrainian military district (Yakubovsky) and of another from Leningrad (Sokolov). The inference is that this looks like a case of balancing the claims of a Brezhnev nominee against those of the nominee of the powerful Leningrad party organisation from which such strong aspirants to the highest party office as Andrey Zhdanov and Frol Kozlov have sprung. Inference cannot be pushed too far, however. Yakubovsky's tour of duty in the Ukraine has been of less than two years' duration. Sokolov's career is only very sketchily documented. It may be important that he saw service on the Karelian Front during World War II, but it was not notorious enough to be described in the definitive 6-volume *History of the Great Fatherland War, 1941 - 45.*

The TASS announcement of April last, clearly basing itself on the 1966 Year Book of the *Great Soviet Encyclopedia*, unfortunately threw no new light on any of the three appointments at deputy minister level. What, however, is of special interest, is the conspicuous absence of a representative of the strategic missile branch at the first deputy minister level. The pattern of the new appointments does not exhibit any novel trend; indeed, it might be regarded as being too heavily weighted on the side of armour and infantry. Another striking feature of the appointments is that, accidents barred, First Deputy Minister Marshal Yakubovsky at 54 stands an

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excellent chance of succeeding Marshal Grechko when the latter reaches retirement age. This suggests that while the political leaders seem to have accepted with a good grace that the wind of change must blow, they have no intention of sitting out a gale. They have been looking as far ahead as 1984 and appear to have concluded that there is some advantage in arranging matters in such a way that jockeying for the post of minister among the military themselves is reduced to a minimum. In particular, Marshal Krylov's star cannot now be expected to rise higher.

At the same time, the political leaders are taking no chances in another sense. The promotion of three youngish senior officers provides them with an opportunity to change their minds with the minimum of disturbance at a later date if their present nominee for the post of minister should fail politically, militarily, or in health. That this contingency may well be in their minds appears to be borne out by the age structure of the deputy ministers echelon as it is at present constituted:

MSU Bagramyan	Dep. Min.	Born 1897	In post, June, 58
MSU Zakharov	1st Dep. Min.	Born 1898	In post, Nov. 64
MSU Chuikov	Dep. Min.	Born 1900	In post, May 60
Air Chf. Mshl. Vershinin	Dep. Min.	Born 1900	In post, Feb. 57
MSU Moskalenko	Dep. Min.	Born 1902	In post, Dec. 66
MSU Grechko	Minister	Born 1903	In post, Apr. 67
MSU Krylov	Dep. Min.	Born 1903	In post, May 63
Army Gen. Penkovsky	Dep. Min.	Born 1904	In post, Sep. 64
Army Gen. Pavlovsky	Dep. Min.	Born 1909	In post, Apr. 67
Army Gen. Batitsky	Dep. Min.	Born 1910	In post, Oct. 66
Adm. of the Fleet Gorshkov	Dep. Min.	Born 1910	In post, June 56
Army Gen. Sokolov	1st Dep. Min.	Born 1911	In post, Apr. 67
MSU Yakubovsky	1st Dep. Min.	Born 1912	In post, Apr. 67
Col. Gen. Komarovsky	Dep. Min.	Age not known	In post, Feb. 64

At the time of writing, the fields of responsibility of the new deputy ministers have not been made known. Marshal Yakubovsky's appointments in the past ten years, however, fit him admirably to succeed Marshal Grechko as Commander-in-Chief, Warsaw Pact forces. From 1957 to 1965 he was in Eastern Germany, first as First Deputy Commander-in-Chief of the Group of Soviet Forces (to 1960), and then as Commander-in-Chief, with a short spell as deputy during the period of the Berlin Wall crisis (when Marshal Konev was despatched from Moscow to command). In 1965 Yakubovsky became Commander-in-Chief of the Kiev Military District, in which capacity he would still have been intimately connected with the Warsaw Pact forces as a provider, when required, of assault troops, reinforcements and other support facilities. Most recently he was reported by Radio Moscow as having taken charge of a joint staff training exercise of Soviet, Czechoslovak and Hungarian components of the Warsaw Pact forces somewhere in Czechoslovakia and Hungary.[2] But there has still been no announcement of his appointment as Commander-in-Chief.

It is not beyond the bounds of possibility that this question was aired by the Soviet leaders and East European defence ministers when the latter were in Moscow for

2 Radio Moscow home service, June 19, 1967.

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Marshal Malinovsky's funeral and may even have been touched on by Brezhnev at the meeting of the CPSU Central Committee in Moscow on April 4, which was attended by a large number of high-ranking military officers in addition to those who would normally sit as committee members. A formal announcement will presumably be made only after the governments of the East European countries have signified their approval and the Political Consultative Committee meets to confirm this. One obstacle, which may still have to be surmounted by the Soviet leaders, is possible Rumanian objections to another Soviet Commander-in-Chief. There have been several indications of Rumanian support for the idea of rotating the post, although the Soviet Union — reasonably enough — has argued that, as the main source of weapons and equipment for the East European member countries and as the most important participant, the post must be filled by a Soviet officer. It may not be easy to bring the Rumanians round in their present independent mood but it is not beyond the realm of possibility that, *if* a Soviet officer is appointed, he may not hold an official position in the ruling hierarchy in Moscow, as Grechko did.

No hints have been dropped about Army General Sokolov's field of responsibility. The suggestion has been made that, in the light of Marshal Zakharov's age, Sokolov may have been lined up to succeed him as Chief of the Soviet General Staff. Another theory runs that he may possibly have been selected to fill the post of Commander-in-Chief, Land Forces, which there is some reason to believe is on the point of being reactivated. On the other hand, before going to the Leningrad Military District as Commander-in-Chief, he was closely connected with combat training in the Moscow Military District. This has tempted some observers to see Sokolov as Army General Penkovsky's replacement as Deputy Minister in charge of Combat Training. At the moment, as a stream of articles in the Soviet military press has indicated, a considerable job awaits someone in the Defence Ministry adjusting the whole training system to the increasingly rigorous demands of combat readiness in the nuclear age and, more generally, overhauling staff courses and the more humble type of training that goes on, day in and day out, in units. However, if the attendance of Army General Pavlovsky at a "multi-level exercise of higher staffs and commanders" of the northern tier forces of the Warsaw Pact organization from May 27 to June 5[3] may be taken as a portent, it is Pavlovsky, not Sokolov, who is destined for Penkovsky's post. Certainly this is a view which has some proponents in London. Pavlovsky's first-hand knowledge of conditions in the Far East, where he was recently Commander-in-Chief, would, of course, be available to the General Staff and to Marshal Grechko, who unlike Marshal Malinovsky, is not his own Far Eastern expert. This particular surmise, however, has to be set against another which appears to have adherents in Washington. This is that Pavlovsky's transfer to Moscow is possibly connected with a projected reorganization of the vast region at present divided among the Siberian, Transbaikal and Far Eastern Military Districts into a theatre command in the face of the rising Chinese threat to the Soviet position in the Far East. However, by the time these words appear in print, Moscow may have let it be known what jobs the new service chiefs are, in fact, filling and thus put an end to the speculations of the Kremlin watchers.

(3) *Neues Deutschland*, June 6, 1967.

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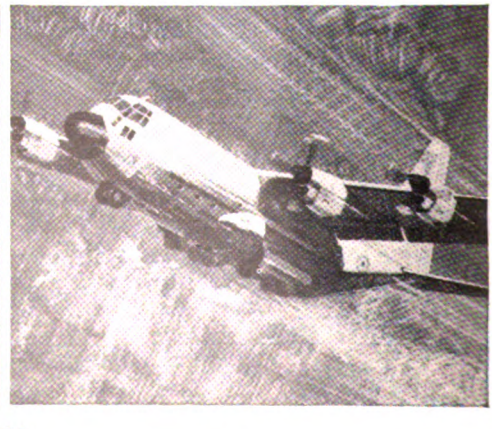

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A COMPOUND OF OPTIMA

By Squadron Leader T. H. Sheppard, M.B.E., F.R.G.S.

THIS is really an essay on command and leadership in the Royal Air Force, but to title it such would have put you off. And not unnaturally. 'Command and Leadership' has a rather hackneyed ring about it derived, no doubt, from its associations with AMP 202 and the trauma of learning suitable mnemonics for promotion exams. And if we are honest we probably feel, anyway, that it does not apply to **us.** But, like so much else, it is all changing. Firstly, if we stopped to think about it we would see that, these days, command (which implies authority) cannot achieve best results without leadership (which implies the winning of men's wills). And best results are what count. A commander's strength or weakness is in his men; it is within his power to influence how they feel and therefore the results which they — and he — achieve.

THE LEADER AND THE LED

All command is relative. A cleverer, more proficient, better educated, more powerful man will find it easy to maintain authority over less well imbued colleagues. Hence the classic concept of the 'officer class' embraced a system of command in which by reason of birth, manner of speech or type of schooling, one man was able, by the sheer gap between himself and his men, to maintain authority over them. When a gap of this sort narrows a greater call is made upon the powers of pure leadership of the individual in command.

Because of generally rising standards of living and the particular skills required of officers and men in the Royal Air Force today, suitability for command depends less and less on background. In the Royal Air Force the 'natural gap' between officers and men has closed until in some cases it is non-existent.

Selection for aircrew requires primarily manipulative skills, co-ordination, intelligence and mechanical aptitude. Since all aircrew are officers, superimposed upon these skills, but more capable of development and training-in, are 'officer qualities'—the background and education. Since the former qualities are inherent in individuals and occur irrespective of class and social strata it follows that the spectrum of society from which officer aircrew are drawn is broad. And, since the increasing complexity of Service equipment now demands similar standards of intelligence and mechanical aptitude of our airmen, it follows that the 'natural gap' cannot help but close. And, as in any society of compressed social strata, the airman of today demands better leadership and is critically discerning when he does not get it.

The Types of Leadership

Although the concept of their definition is old, it is worth recalling the three classical types of leadership the more easily to personify their description. The

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passive, the autocratic and the permissive have long been the labels attached to the three types of leader. The passive leader is an averaging device recognised for his reluctance to impose his will and his lack of impact or dynamism; he is generally tolerated by his men with equal passivity. The far end of the scale sees the autocratic leader with the drill sergeant approach, roughshod and insensitive, who probably regards himself as a 'go-getter' but is almost invariably lacking in real perception; from his men he gets instant obedience—and surreptitious scorn.

Inevitably, for leadership is truly a counsel of optima, not maxima, the permissive lead lies somewhere in between the two and is hardest to achieve. Whilst having firmness of purpose, the permissive leader is yet a good listener; his approach is intelligent and flexible since he is dealing with intelligent people. He recognises truth and the ability of his subordinates and gets the best out of them; he combines their efforts with his own vigorously to pursue his set aim. Whilst giving his men their heads he must yet know the touch of the autocrat to bring them back into line or regain the respect of those who take advantage.

THE COMPONENTS OF COMMAND AND LEADERSHIP

The interdependence of command and leadership should now be clear. It will be seen again when the attributes of command are examined, for many of these qualities will themselves contribute strongly to good leadership.

Attributes of Command

Professional knowledge, the ability to see essentials clearly and the ability to delegate; only these can put a man on top of his job. If he knows exactly what his job is about, he can judge quickly and decisively what matters most and, by appropriate delegation of detail which will leave him free to keep an eye on the overall scheme of things, can best direct efforts to achieve the aim. In delegating he must fulfil the conflicting requirements of trusting his subordinates enough to delegate detail to them and yet at the same time (for he must judge these men's abilities too) he must be able to sieve delegated detail—a lot of it—and pick out the important bits to see that they are properly dealt with. Delegation and supervision balance finely at opposite ends of a long rod and it requires perceptive judgement by the commander to decide, separately for each of his subordinates, where the delicately chosen fulcrum lies.

So clearly an attribute of command that the mention of it is almost trite, courage must be allied to the qualities above to complete the picture of the effective commander. Moral courage and tenacity are essential and probably the qualities that must set the commander above his men most. The ability to make the hard decision and the ability to stick to what is known to be the right course of action despite doubtful or discordant advisers are essential qualities. Almost invariably the big decisions are the clearer and easier to make. It is the small ones upon which the discipline, morale and day to day running of the unit depends. Men will respect and quickly recognise a commander with integrity, fairness of mind and moral courage, but morale will be low on the unit for whose commander expediency, inconsistency and weakness are character traits.

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It will be seen from the preceding paragraphs that the qualities of a good commander will in many instances automatically produce the ingredients of good leadership. This is because of the respect which these qualities generate in the men under command. Let it never be forgotten that whatever their own standards, airmen — or any subordinates — have a very clear picture in their own mind of the qualities a commander should have and what his standard of behaviour should be; and the commander is never free from the scrutiny of his men.

The Optima of Leadership

Example—in all things—follows on. And additionally the leader must inspire affection by his personal qualities. This is perhaps the most indefinable part of the task for it is such a compound of optima and the whole so subjective that to try and impose standards is impossible. Enthusiasm, sincerity and humility, though, are worth consideration.

In an age when cynicism and satire are considered smart but are all too often a thin veil for laziness, underconfidence or ignorance, it seems almost archaic to counsel enthusiasm and sincerity. Yet there are few to whom these qualities will not ring true so long as the leader is careful not to take himself too seriously or overdo them. Both are infectious—upwards and downwards. Enthusiasm will carry the worst jobs through effectively whilst sincerity is the classic quality of the 'solid guy' and will bind men to their leader closely.

Humility sometimes conjures up a pious picture and is in this sense possibly the wrong choice of word. But here it is meant as the quality of the true logician—the ability to start with an open mind, to listen to others at all levels, and to admit if and when you are wrong. It is a quality that must not be over done for it may be mistaken by some for weakness, but it betrays a high regard for truth—a paramount necessity in a commander—and will be seen, allied to the quality of keen perception, in the great airmen of today. It could also be described as sensitivity—an awareness of the truths and essentials of situations as well as an objective awareness of people, what they think and how they feel. And finally, it will be seen that it must be balanced against (for it is in conflict with) strength of purpose.

ROYAL AIR FORCE LEADERSHIP TRAINING

It is worthwhile summarising the principles of present leadership training. Since it is only in practical training that the trainee can be made to see how his own character needs whittling or bolstering to fulfil the widely accepted concept of a leader and commander, this is the keynote of leadership tuition for all direct entry aircrew cadets.

Exercises take the form of a nominated leader controlling a group of his contemporaries in the execution of a practical task such as building a rope bridge. Planning, briefing, the operation itself and the debrief comprise the four stages of any exercise. It soon becomes apparent to the cadet that the back-slapping extrovert, who on the surface might be expected to be a good leader, is not always so in practice. The importance of planning, in which intelligence, thoroughness and imagination are

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important; the importance of briefing, in which clarity of expression, enthusiasm for the job, sincerity and confidence in its eventual success pay dividends—these two aspects of the exercise that precede any practical work are soon seen as the key to the operation.

The operation itself can exercise the leader's presence of mind, man management and dynamism whilst in the debrief his ability objectively to discuss successes and failures and fairly award praise or criticism are revealed. Every aspect of the exercise is closely supervised and subsequent discussions are absolutely frank.

Thus all facets of leadership are covered. The system is effective and its limitations lie only in the brevity of the course and the difficulty of providing continuity thereafter.

As a final thought it is surely worth considering the needs of Junior NCOs in the Service. With the close contact they have with their men both on and off duty theirs is possibly the hardest rank in the Royal Air Force to hold effectively. The junior NCO must maintain authority at work and is yet with his men when relaxing off duty. The very early age at which a technical corporal may have to lead his contemporaries or hold his own with far more senior aircraftmen in supply or secretarial trades deprives him of the natural prop that age and experience afford and makes him more reliant on powers of pure leadership. It is an invidious position and one that must partly account for the generally low standard of NCO qualities seen in the Service today. Corporals need leadership training too.

LEADERSHIP IN PRACTICE — THE STATION COMMANDER

When the depth and variety of experience of the full spectrum of Royal Air Force station commanders is considered it would take a very brash man indeed to advise them all on how best to go about their jobs. By the same token it would be an uncommonly smug bunch, at any level, that felt it had all its problems licked. The instance of the station is taken, however, almost hypothetically, since, probably better than the flight or squadron, it is the microcosm of a full and challenging 'leadership situation' and offers the complete gamut of problems encountered on smaller units. Thus in considering the practical problems, aims, and solutions on a station, the same problems, aims and solutions will present themselves on smaller units. Let us examine some of these aims and the means of their attainment.

One of the most important, yet in this mobile and affluent age one of the most difficult, jobs of the station commander is to give his men a feeling of belonging to the station and of having a pride in it. The location of the station can greatly affect its espirit de corps; a desert outpost or isolated station will automatically have a corporate spirit by reason of the sheer isolation and lack of alternative affiliations. The unit commander has only to harness that spirit the right way to generate pride in the unit. A large station near a large town, on the other hand, is at a disadvantage. An airman only feels he belongs to a unit if the unit makes him feel it is so. Big stations generate anonymity unless dynamic leadership is displayed by section commanders and station commander in concert.

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People personify. If a man can attach a face to an office, post or position it will mean something to him. Here the station commander must be the station. He must permeate its every happening, its every section, its every trial and tribulation so that he is seen to be a part of it by his men and so that he gets to know them and their problems at the same time. In doing this he can communicate to his men the importance of the job they are doing and keep them in the picture at the same time; both these things will help them think of the station as an entity and consider themselves part of it.

Discipline comes next. We have perhaps our predecessors of 25 years ago to thank for the present day myth that Royal Air Force discipline is not and has no need to be strict. The same people, no doubt whose conception of 'discipline' goes no further than having a daily drill parade. Discipline, by definition, implies no more than sticking to certain rules—in this case Station Standing Orders and QRs. In this respect the station commander has a heaven sent opportunity to enforce rigid discipline. And that does not mean what it sounds as though it means. It simply gives him the chance to ensure that what goes on agrees with the rules — and he has the unprecedented freedom to alter the one *or* the other, and equally, to allow people to use their discretion. He can make Station Standing Orders a living and useful document designed to assist rather than be an end in itself. He can ensure orders are reasonable, delete those which are not, and perhaps best of all, can do away with those endless 'umbrella' orders designed merely to keep him covered.

The reason for this attention to accurate, reasonable orders, of course is that only that way do the men feel there is a sound basis of discipline and know where they stand. They know exactly what is expected of them and it promotes a positive approach at all levels to the running of the station. Hence today we have more than ever the need for sensible discipline; the need for sticking to it and, if the reason for it is clearly shown, it will enhance morale and not, as some think, depress it.

Closely allied to discipline is tidiness. Often confused with pre-inspection 'bull', there is a sound reason for tidiness on a Royal Air Force station. It is by definition careful arrangement on the one hand and disposal of the superfluous on the other. It is an attitude of mind that, if sensibly nurtured, will extend into all fields of Service work—which is where it really matters; tidiness is wiping down an engine after it has been worked on so that subsequent oil leaks will show; tidiness is disposing of old files and ensuring that a filing system is an aid to administration rather than a hindrance. Hence in a hundred ways a tidy station is an efficient one and efficiency, as with good discipline, breeds good morale. It does so because the men can see they are achieving something and every good leader should aim to give this feedback of encouragement to his subordinates.

A favourite station scapegoat is 'Them'. It is always 'They' who have decided to issue an unpopular order, or 'They' who have ordained a working week-end. This again is partly the personification mentioned earlier and partly its opposite in that it is so anonymous. If the men on a station know what they are there for and what is

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going on they develop a sense of purpose and the complaints against 'Them' are fewer. Quite within the bounds of security, airmen can be given, by a periodic informal address, an insight into the current problems of the station; if they are not, the wildest rumours will quickly outstrip the facts of any situation.

It has already been mentioned that there is a very fine balance between delegation and supervision. The thin dividing line that separates good supervision from over-supervision is nowhere keener felt than in the Royal Air Force where, because equipment is becoming increasingly expensive, the tendency is towards oversupervision. It is for some, particularly an active and able commander, an agony to watch anyone less able perform a task. Yet delegation there must be and the commander must show, by his lack of excessive involvement, that he trusts his section commanders. The CO who by-passes his own section commanders, as well as confusing the eventual recipients of the orders, arouses considerable resentment in the section commanders themselves for they are made to look superfluous in the eyes of their men. If for urgent or unusual reasons it is necessary for a station commander to intervene directly he should ensure that the section commander concerned is put in the picture at the earliest opportunity.

CONCLUSION

From the nature of the qualities involved we have seen that leadership is more a question of optima than maxima and we can perhaps sum up on this basis. First, though, there are some other conclusions that may be drawn.

The higher technical standards of the modern Royal Air Force has narrowed the social and educational gap between officers and airmen and calls for higher standards of leadership. Leadership can, and must, be studied and taught; permissive leadership must be the aim and NCOs must be taught also, for their need is as great as that of officers and they may be less well equipped to deal with the problems. And there must be an overall atmosphere of *sensible* discipline.

Despite the individual and optimised approach that leadership demands, there are some maxima that may be striven for by all. First of these is professional knowledge. Whatever his other shortcomings, a really professional commander will gain the respect of his subordinates and this is one of the pillars of leadership. Secondly comes sincerity. There can be little more repugnant to subordinates than the patronizing approach of superiors and this is perhaps the commonest form that lack of sincerity can take. Sincerity breeds mutual trust and, like honesty and integrity, should be applied as one of leadership's few maxima.

We have already described leadership as a 'compound of optima'. Perhaps the four headings of greatest importance in this optimization would be, firstly, the achievement of the best permissive leadership whilst retaining in reserve the touch of the autocrat; secondly, finding, for each subordinate, the right balance of delegation and supervision; thirdly, what is pompously called 'the common touch' but amounts to the ability to mix easily with superiors and subordinates alike; and fourthly, having the self confidence to satisfy the often conflicting requirements of, on the one hand humility and sensitivity in the pursuit of truth and, on the other, having accepted where the truth is judged to lie, to then bring to bear strength of purpose.

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Ret.)

AFTER the issue of the annual Defence White Paper last February and the consequent debate in Parliament, both of which were reported in the Summer Number of this Journal, there has been little of general interest. This article must therefore be concerned mainly with incidentals.

AIRCRAFT

Concord: In reply to a question, Mr. Stonehouse said that the ground tests and flight testing required for Concord would take place mainly at Filton (Bristol) where the aircraft is being developed, but the latter would also range over a wide area. Mr. Mallalieu said that the Concord would be able to use any British airport which had adequate facilities, subject of course to the airport owner's consent; and that when leaving British airports it would not fly supersonic until it was over the sea. As to the cost of this aircraft, Mr. Stonehouse said that the current estimate of the extramural costs to the two Governments (French and British) of developing Concord was £500 million, of which the British share is one half.

F.111: Mr. Merlyn Rees said that the additions to be made for the R.A.F. version of the F.111 included a strengthened under-carriage, avionics and fittings for the British reconnaissance pod. Mr. Healey (Secretary of State for Defence) said that the unit cost of the 50 F.111.K's we have ordered remains, as hitherto, about £2½ million. (This figure, he added, allowed for the cost of the special British requirements and installed equipment.) The cost of support equipment and initial spares, he said, was currently estimated at about £55 million. These costs, it now appears, are subject to adjustment owing to the rising costs of labour and materials; but this is normal to long-term contracts. Mr. Healey assured the House that he had fixed a firm ceiling for the cost of the basic aircraft, and also an agreed ceiling for the cost of the supplemental features of the British F.111.K, "which at 1965 prices cannot be exceeded." He also said that the aircraft which we were buying would in all respects surpass the operational requirements which we had set for it. At a later date, he informed a questioner that the order of 50 F.111.K's provided for normal repair and wastage replacement, and that no further provision for replacement aircraft had been made.

On 1st May, Mr. Enoch Powell (Shadow Minister for Defence) attacked the Government for what he called their "contradictory statements about the purchase

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of the United States F.111.K aircraft " and he called for " a realistic statement of its prospective cost and potentialities." The story of the F.111.K, he said, went back a considerable time, for within six months of taking office the Labour Government had announced to Parliament its decision to cancel the TSR.2 aircraft. That decision opened two major questions: (i) whether the capability of the cancelled TSR.2 was needed at all; and (ii) supposing it was, by what aircraft, or combination of aircraft, should it be provided? The Government's answers to these two questions were contained in the Defence White Paper of 1966. Their answer to the first question was " Yes "; but their answer to the second question was more complicated. It was that the upper end, so to speak, of that capability would be met by the purchase of the American F.111 modified to meet special British requirements. But they intended to purchase only 50 of these because they assumed that the proposed Anglo-French Variable Geometry aircraft (AFVG) would, after the mid-seventies, take over some of the functions of the 50 F.111.K's. On the AFVG he would say only this: all the key decisions are yet to be taken; the aircraft — its character, its practicability, its cost, and everything else about it — remain, not in the air but in the realms of assumption. And he then challenged the Government on the estimated cost and hypothetical performance of this aircraft; winding up by saying, " There is more than a little ground for the fear that the F.111 purchase could prove a fiasco which was costly — not only in money."

The Secretary of State for Defence (Mr. Denis Healey) began his reply by saying: " The right hon. Member for Wolverhampton, South-West (Mr. Powell) makes two types of contribution to our discussions on defence. On the big issues, he confines himself to an oracular ambiguity which enables him to pose as a profound thinker without ever saying precisely what his policy is; on the small issues, all we get from him is a pedantic nit-picking. He builds up elaborate structures of argument to a dizzy height — but always on false or inadequate foundations and always of staggering irrelevance to the issues which the House should be discussing." Mr. Healey then went on to explain what we want this aircraft for, the sort of specification required to meet its role, how it measures up to the operational requirements, what it costs, and finally the part played by the F.111.K in an overall programme of aircraft procurement.

The F.111.K, he said, was not to replace the V-bombers as a strategic nuclear delivery system, which would be the role of the Polaris submarines. The F.111.K, like the T.S.R.2 which it replaced in our programme, was planned as a tactical strike and reconnaissance aircraft delivering conventional weapons in the strike role; and it would come into squadron service in two years time, *i.e.* in 1969. Tactical strike and reconnaissance was the military umbrella which we must have to protect our forces — land, sea and air — from attack. As to its specification, he said that the operational requirement for F.111.K was, in almost all respects, the same as that laid down for TSR.2, about which there was no argument. It had to have maximum tactical flexibility, high speed, advanced performance at high altitudes and at very low levels, and an accurate means of navigating and of aiming its weapons. Variable geometry, he continued, which was a characteristic the TSR.2 did not have, had

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greatly eased the designer's task of combining all these characteristics in a single aircraft. And in addition to the characteristics already mentioned, we needed a substantial range or radius of action; because the mobility of our air forces was increasingly important, not only for strategic flexibility but to reduce our need for base facilities overseas. Turning next to performance Mr. Healey said that the ferry range of F.111.K was substantially in excess of that planned for TSR.2, and no less than 500 miles in excess of the requirement laid down for TSR.2. As regards bomb-load, with its wings swept back, the F.111.K could carry a maximum load three times that of the Canberra and only slightly less than that of the Vulcan; while with its wings unswept, the F.111K load was over five times that of the Canberra and more than one-and-a-half times that of the Vulcan. Having indicated that the Government would not accept the aircraft unless it met their specifications, the Secretary for Defence turned to the question of cost. He emphasised that F.111.K would cost very much less than TSR.2, partly because it was already under production in the U.S.A.; and that the actual saving, over a period of 15 years, would be £700 million — according to the Government's calculations. Summarising what he had already said, Mr. Healey stated that they had been guided by three main considerations: (i) to provide the Royal Air Force with the aircraft it needs to deter aggression and to keep the peace; (ii) to maintain the necessary level of technological expertise in the aircraft industry; and (iii) to keep the taxpayer's insurance premium at a minimum. The present aircraft programme, he concluded, met all these three requirements. The TSR.2 would have been a fine aircraft, but the F.111.K was its equal; and TSR.2 priced itself out of existence. The Plowden report had confirmed that future requirements for large and complex weapons systems should be developed collaboratively. Our country simply could not afford a purely domestic venture like the TSR.2.

A.F.V.G.: At the end of a short debate on 22nd March, the Minister of State, Ministry of Technology (Mr. John Stonehouse) gave some interesting information about the Anglo-French Variable Geometry aircraft. It appeared that the Royal Air Force would have a requirement for such an aircraft in the mid-1970's, when the project, if it materialised, was expected to come to fruition. As we could not afford to develop aircraft of this advanced type solely to meet the needs of the R.A.F., we "entered into discussion with the French with a view to fulfilling their needs as well as ours from a joint development programme." The French have their own ideas and we have ours, and these must be reconciled. The French want the aircraft as an interceptor, while we want to use it in the strike role. Then there is the necessity of deciding how the work will be shared out between the aircraft manufacturers (British Aircraft Corporation and Avions Marcel Dassault) and the engine manufacturers (Bristol Siddeley and S.N.E.C.M.A.) In order to reduce the unit costs by increased production, which depends on wider markets, we have already approached the West Germans and the Dutch with a view to selling to them some of these aircraft, modified to suit their individual needs. At present the project is not very far advanced, but the "definition study stage" is expected to be completed this year; and until a precise specification is produced, as the result of this study,

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no reliable cost estimates can be made. It is expected, however, that the AFVG aircraft will be available for squadron duties in the R.A.F. by the mid-70's.

TSR.2: In reply to a question by Mr. Enoch Powell, Mr. Wedgwood Benn said that, in terms of weight of metal, the bulk of the TSR.2 manufacture had been disposed of as scrap; but there were important exceptions. Of the first five prototype aircraft, three had been allotted to Government establishments for ground research purposes, and one each of the other two to Cranfield College of Aeronautics and Henlow Aeronautics Museum. The engines and some major aircraft structures were reserved for other research work. The more important equipments designed specially for the TSR.2 had, in most cases, been used in Ministry establishments in aid of general development work or had been transferred to other aircraft projects.

Hercules: In reply to questions, Mr. Merlyn Rees said that the cost of a Hercules was just over £900,000; and that the last aircraft on order from the U.S.A. would be delivered in the U.K. in June, 1968. He also said that the total running costs of the Hercules force at its maximum strength would be about £10 million a year, including spares, repairs and fuel for aircraft and associated ground equipment and the cost of aircrew and servicing personnel.

Canberra: Mr. Merlyn Rees also said in the house on 31st May that the Canberra squadrons in Germany would, in due course, be withdrawn without direct replacement; but some of their tasks would be allocated to the ground-attack Phantom squadrons from 1970. In addition, U.K. based F.111's and V-bombers would be available to SACEUR in emergency. Mr. Goodhew asked when we were to have the AFVG aircraft, which was surely an important part of the replacement for the Canberras; and Mr. Rees replied, " We have made arrangements for the replacement of the Canberra in other ways before the advent of the AFVG."

ADEN

On 15th March, Mr. Fisher asked the Secretary of State for Defence whether, in view of the fact that it had proved increasingly difficult to maintain law and order in Aden in recent months, he would speed up the withdrawal of the wives and children of Servicemen in order to save further loss of life. To this, Mr. Healey replied that present plans were for the withdrawal of Service families between 1st May and 31st July, 1967. They were keeping a close watch on the internal security situation to see if those plans should be brought forward.

In reply to another question on 12th April, the Secretary of State for Defence added that the comprehensive range of measures taken to protect families included patrols, guards, flood-lighting, escorts and the use of secure areas.

A MILITARY OMBUDSMAN?

On 8th March, Mr. Fisher asked the Secretary of State for Defence whether he would seek the establishment of a military ombudsman with power to investigate personal cases where matters of national security were not involved. The reply was " No."

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The Service Widow

By Flight Lieutenant W. D. G. Blundell, R.A.F.(Retd.)

WITHOUT getting dramatic, the serviceman can, has and will face dangerous situations that other citizens of our country do not. Admittedly he is a volunteer for this sort of life and gets reasonable pay for it, yet can it honestly be said that there is an element in his salary to cover every aspect of his life and possible death throughout his career on the active list? If a married serviceman dies he leaves a widow and, in most cases, children. A widow with children has the same basic problems whatever rank her husband may have held.

Any service widow is entitled, in addition to State pension for which she may qualify, to a Forces Family Pension if her husband had completed sufficient service to qualify for a pension himself at the date of his death. In the case of an officer this is ten years service, for a man in the ranks it means 12 years total service. The fact remains that some widows do not qualify for a pension and even if they do it may be quite small as the following examples show:—

Rank	Service Given	Forces Family Pension and Death Gratuity	Normal State Pension
a. Flt. Lt. and 2 children	12 years service since age 21	£5 5s. 0d. £1,215	£7 12s. 0d.
b. Fg. Off. and one child	5 years service since age 21	Nil £525	£6 0s. 0d.
c. Sgt. and one child	25 years reckonable service	£3 0s. 0d. £950	£6 0s. 0d.
d. Cpl. and 5 children	9 years service	Nil £260	£12 2s. 0d.
e. S.A.C. and 3 children	12 years service	£1 19s. 0d. £252	£9 2s. 0d.

It should also be noted that there is provision made for widows ' war ' pensions, administered by the Ministry of Social Security, which are awarded where the husband's death is attributable to service irrespective of the length of that service.

From the examples shown it is obvious that the married serviceman, unless he is a person of considerable means, must take out some form of insurance to cover the event of his untimely death. To obtain this cover he will go to a reputable insurance company and pay premiums that he can comfortably afford. Why it has not been done long ago I do not know but, in my opinion, the government ought to institute an insurance scheme whereby no serviceman's widow was left in a financially bad position. In wartime the serviceman's welfare is prominent; in peacetime he

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tends to be neglected although there are many nasty, little publicised situations that he has to contend with. Perhaps the late Rudyard Kipling summed up this point best; may I quote: —

"Oh, it's Tommy this, an' Tommy that, an' 'Tommy go away;'

"But it's 'Thank you, Mr. Atkins,' when the band begins to play."

However, from the nineteenth century to 1967. In the British Armed Forces there are approximately 400,000 men; considerably more than half — my personal estimate is three-quarters — are married. The crude death rate for the R.A.F. is around 1.63 per thousand. Let us assume that this figure applies to all three services; therefore there would be 652 deaths a year for 400,000 men. Erring on the pessimistic side completely I shall allow for 1,000 deaths a year and assume that, of these, 750 are married men.

A realistic amount of money would be £8,000 for every service widow; this sum would be paid to all regardless of the rank of husband or number of children. It might appear from the first glance at the figure mentioned that the young widow, with no children, would get a far better deal than the older widow with several children; however, as all personnel will have to pay the same premium, regardless of rank or number of children, their dependent(s) will be entitled to the same benefits.

The estimated number of married servicemen, assuming three quarters of the total, is 300,000 and therefore:—

(a) If 300,000 men each contributed £20 a year, the annual income would be £6,000,000.

(b) If 750 new widows each year received £8,000, the annual expenditure would be £6,000,000.

So for £20 a year the married serviceman would be insured for £8,000; there is no private insurance company that could offer such a low rate for this sort of cover. The low premium is due entirely to the old maxim, "United we stand, etc." and the fact that the scheme would be non-profit making and have no overheads.

The method of receiving premiums and paying out of gratuities would be simple enough; the treasury would deduct the money from the source (the serviceman's pay) and pay out the gratuities as required. No extra staff would need to be employed, all that is happening — in essence — is that at the beginning of a financial year the treasury holds on to £6,000,000 and then pays out from this sum the gratuities.

To the junior ranks of the Armed Forces, including many officers, a scheme like this is essential; to the more senior or affluent an extra £8,000 of insurance — at such a low premium — can not come amiss. As I have deliberately overestimated the number of deaths, to allow for a generous safety factor, the premium would be less — in practise — than the £20 quoted. Even those of the very lowest rank could afford such a premium which is less per week than two packets of cigarettes.

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At the present time, as is obvious from the examples given at the beginning of this article, there is a wide range of pensions and gratuities paid — apart from the normal State pension — by the Armed Forces according to the husband's rank and/or length of service and the circumstances in which he died. Whatever the circumstances, whatever the rank held or however long the man had served the stark, inescapable fact remains — apart from the tragic emotional side — a woman has lost the earning capacity of a bread winner for herself and her children. The only substitute for this loss is a really decent sum of money; there can be no illusive talking round this statement of fact.

Why not pay all service widows exactly the same? After all £8,000 is a reasonable sum for anyone. If, in his career, a man is fortunate enough to rise to high rank then he will earn — deservedly — much higher salaries and there is no reason at all why he should not increase his private capital or take out additional policies above and beyond the suggested scheme.

Should the government subscribe to this principle of the suggested scheme being the standard recompensation for the widow of a serviceman instead of the present arrangements, then it would not be unreasonable to suggest that they might consider subsidising half the cost of the scheme. It would cost the government £3,000,000 a year maximum, but a large amount of this sum would come from the money that would be paid out under existing arrangements. In time it is most likely that the strength of the Armed Forces will decrease and, if this is so, under present arrangements for widows future governments will still be paying out service widows' pensions as an overhang from the days when Britain had comparatively large Armed Forces. My suggested scheme is still applicable whether the Armed Forces expand or contract. One clear cut payment of an adequate sum of money and that is the end of the matter — thus the widow of 1967 would not be a burden to the economy in 1987, if she is getting a service pension though she will be — over the years my suggested scheme is likely to prove far more economical for the country.

Incidentally, the suggestion of all widows getting the same gratuity is not without precedent. In the U.S. Armed Forces the government has organised — through the medium of reputable insurance companies — a voluntary insurance scheme. All personnel pay two dollars a month and all widows receive 10,000 dollars, plus 2,000 dollars or six months salary whichever is the smaller figure, plus the cost of the burial of the husband in the U.S.A. which includes transportation of the body. I have been assured, by reputable sources, that well over 95 per cent. contribute. Coming nearer to home our own State Widow's pension does not consider the status of the deceased when making an award — a company director's wife with five young children gets precisely the same as a road sweeper's wife with five young children. Where the difference lies between these two extremes is that one man enjoyed a far higher salary and obviously was in a better position to accrue more capital and/or take out more insurance. Is there any reason why the British Armed Forces should differ in this respect? Under these circumstances, if the government subsidised half the cost, the whole scheme would cost the serviceman less than £10 a year.

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Some occupations in the Armed Forces are, without a doubt, more hazardous than others — flying is a good example. Yet, it may come as a surprise to some, less than 25 per cent. of the total R.A.F. deaths over recent years are attributable to this cause. The remaining 75 per cent. plus could apply to any man of any category and include accidents on the road, other accidents, poisonings, violence, malignant, heart and other diseases. So in no way at all does this suggestion of mine mean that personnel on less hazardous duties are supporting those on more hazardous ones. My suggested scheme gives the maximum cover for the minimum cost to every married serviceman.

I do know that the Royal Navy, at the present time, are considering a less ambitious scheme; the Army have introduced a small scheme. These are steps in the right direction but it is no use the three services going off in little penny packets over this issue. If all three services act together over this matter far better results can be achieved as I have pointed out with my suggested scheme.

£8,000 is a lot of money, even in this day and age; it can never replace a husband but it can help to ease the service widow's burden considerably. There are many ways to invest money but they are beyond the scope of this article. The best advice that I could give a widow, with this amount of money, is that she should go to a reputable bank manager and get his assistance in handling the money.

In conclusion the advantages of this scheme, which has been long overdue, are:—

(a) No service widow would be left in a bad financial position.

(b) The government would show a deep and tangible interest in the welfare of the Armed Forces.

(c) Internal and, almost certainly, external recruiting would be stimulated in the certain knowledge that the Armed Forces took good care of their own kind.

(d) Whether the Armed Forces expand or contract this scheme can still function as it is one clear cut payment instead of long drawn out pension schemes which, will in the future, cost more than the scheme suggested.

(e) The administration of the scheme, using the treasury or a reputable insurance company, is simple and requires no extra staff or overheads at all.

(f) The financial strain on the benevolent funds would be considerably eased. In a personal letter to me the Controller of the R.A.F. Benevolent Fund, Air Marshal Sir John Whitley, K.B.E., C.B., D.S.O., A.F.C., R.A.F.(Ret'd.), said that in 1965 the R.A.F. Benevolent Fund disbursed £380,000 to service widows.

(g) This simple system would replace the more complex present systems of pensions, terminal grants and gratuities awarded to widows by the Armed Forces in addition, of course, to the normal State benefits.

(h) The vast majority of future widows of officers and other ranks would gain financially with this scheme as opposed to existing arrangements.

(i) No system can be perfect but my suggestion improves considerably the situation, in the event of death, of the vast majority of married men in the Armed Forces.

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"THE QUARTERLY'S" FORUM FOR DEBATE

LETTERS TO THE EDITOR

From Wing Commander H. R. Allen, D.F.C.

The debate between Air Marshal Sir Robert Saundby and myself is one of vital importance to the nation. It must, therefore, be removed from the context of single service loyalties which is an extremely difficult thing to do. This I probably know better than he because I have made the attempt whereas he has not. In the space I hope you will make available to me, I cannot counter all his accusations. I can, however, shed some light on the documents which began the process of causing the Royal Air Force to be formed on 1st April, 1918, as this is one of the points of dissension.

The air attacks on London in July 1917 threw Parliament, to put it mildly, into a political panic. But the Prime Minister, Lloyd George, as shrewd and mendacious a political animal as anyone who has ever occupied that high position, knew just what to do about political panics. So he set up a committee under the aegis of General Smuts who was conveniently in London. By the time that Smuts had drawn up his conclusions, he no doubt reasoned, the panic would have subdued or been overtaken by another sort of panic. The only real requirement that, in fact, existed was to overhaul the primitive air defence system and reinforce it where necessary.

Lloyd George erred because within six weeks Smuts had produced a hastily drafted and often contradictory series of reports which came to the resounding conclusion that an Independent Air Force should be formed at the start of the next financial year; and an independent bomber force should be included in its framework. The grandiloquent central assumption upon which this startling conclusion was based reads in the following words: ' The day may not be far distant when aerial operations with their devastation of enemy lands and the destruction of industrial and populace centres on a vast scale, may become the principal operations of war, to which the older forms of military and naval operations may become secondary and subordinate.'

This certainly came to fruition over Hiroshima in 1945 but what it had to do with the winning of the Great War — the task in which Smuts was involved — is another question. Strangely enough, the figures placed before Smuts upon which he based his recommendations had muddled engine production with airframe production and he was of the firm belief that 3,000 more aircraft would be available for operations than was to be the case. This made a nonsense of the reports as a whole, of course, but they were never amended even when the truth came to light. The extraordinary casualness of the proceedings can be summed up in a remark made later by a member of the Committee, Lord Hugh Cecil. He ' thought the bombing plans rather visionary

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but did not pour cold water as I felt a change was needed.' He did not know who actually drafted the reports. He 'thought' it was Major Storr of the Cabinet Secretariat.

Such incredibly loose thinking did not go unobserved. Lord Cowdray, Sir Douglas Haig, the French High Command and many others protested. Trenchard himself, as head of the RFC in France, opposed the recommendations bitterly putting them down as a 'German plot to disrupt our air forces in the field.' Indeed, the central fallacy, in a mass of fallacious thinking on the part of Smuts, was to confuse the possible potential of the bomber with its then existing ability. He was nearly thirty years out in his estimates. He should have seen that, in 1917, London was clearly vulnerable to air attack from the German Air Force whereas Berlin was hundreds of miles out of range of the British. The aeroplane at the time had many excellent roles to play but strategic bombing was certainly not among them. The sea approaches to Britain aided the penetration of the GAF. Germany, on the other hand, was shielded by the occupied territories of Belgium and France. Also, the sheer size of a country was, and still is, a factor of enormous importance in terms of a bombing campaign, and the Kaiser's Germany was much larger than Britain. To a sea-going nation like Britain ports are not only essential but are highly vulnerable to bombing even of a primitive kind. Finally, and this may be the vital point, the respective capacity of the two adversaries in terms of aircraft production was fundamental to the argument. But there is evidence to show that Germany was not the lesser but far and away the greater aircraft producer of the two.

All in all the Smuts reports were a hotch potch. Approximately 2,000 extra bombs were dropped on Germany in 1918 than had been dropped in 1917; and what on earth difference did that make when they each had a lesser killing power than the average shell? The 300,000 airmen demanded by the Air Staff made, however, a deal of difference when the enormous casualties being suffered by the Army in 1918 are kept in mind. The cost of the independent bombing force was out of all proportion to its effectiveness. The nation could ill afford to pay such a heavy price for getting so little back, towards the end of such a savage and expensive war. The attempt to indulge in a retaliatory policy of air bombardment, granted that the circumstances had been carefully examined — which they were not — was to invite disaster. The accent should have been placed on reinforcing the air defences of Britain instead of flying off at tangents.

In conclusion, I would say that whereas I, personally, am unconcerned by Sir Robert Saundby's savage attacks on me, I am more than concerned that he should, by implication, have attacked the Royal United Service Institution. That Institution has done some valiant work in helping to make sense of Britain's defence policies in its 130 years of existence. Also, I believe that by publishing my controversial article in the first place, the R.U.S.I. is maintaining its long traditions.

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From Air Marshal Sir R. Saundby, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L.

I agree with Wing Commander Allen that our debate should not be conducted in the context of a single service loyalty. My views are certainly not due to unquestioning loyalty to the Royal Air Force, but to the facts as I know them.

It is true that the air attacks on London in 1917 provided one—but only one—reason for the Smuts Inquiry. It is also true that Smuts advocated the formation of a very small Independent Air Force (it never exceeded 11 squadrons out of a total of about 230) to bomb industrial targets in the Rhineland — not the whole of Germany or even Berlin. This was a relatively minor proposal, intended mainly as an experiment.

If Lloyd George had appointed the Smuts Inquiry merely to give time for a panic over our air defence to subside, it would have been perfectly simple for him to have made a few minor adjustments, and rejected or put into cold storage the main recommendations of the report. He could not do so because it was absolutely imperative to end the waste, misuse, and inflexibility inherent in the existence of two separate air forces. This reason holds good today, and will do so in the future.

Wing Commander Allen has evaded this, the main point, under a smoke cloud of inaccuracies and irrelevant argument.

I am sorry that Wing Commander Allen thinks that I have made a savage attack on him, but what does he suppose I thought about his attacks on two wise and far-seeing men, Smuts and Trenchard?

Finally, I intended no attack on the R.U.S.I. On the contrary, I am entirely in favour of its printing any views, however grotesque, provided that they are sincerely held, as I am sure Wing Commander Allen's are. But those who put forward such views should not expect to be allowed to get away with them.

EDITOR'S NOTE

When controversial matters are the subject of articles in this Journal, readers disagreeing with the theories or conclusions are asked to send to the Editor, by letter or commentary, their own views and/or criticisms.

If the RAF Quarterly is used as a medium for discussion and debate on matters of immediate concern to those serving in the Royal Air Force, constructive suggestions could arise, meriting the serious consideration of those concerned.

Such debates would add greatly to the interest and value of this Journal.

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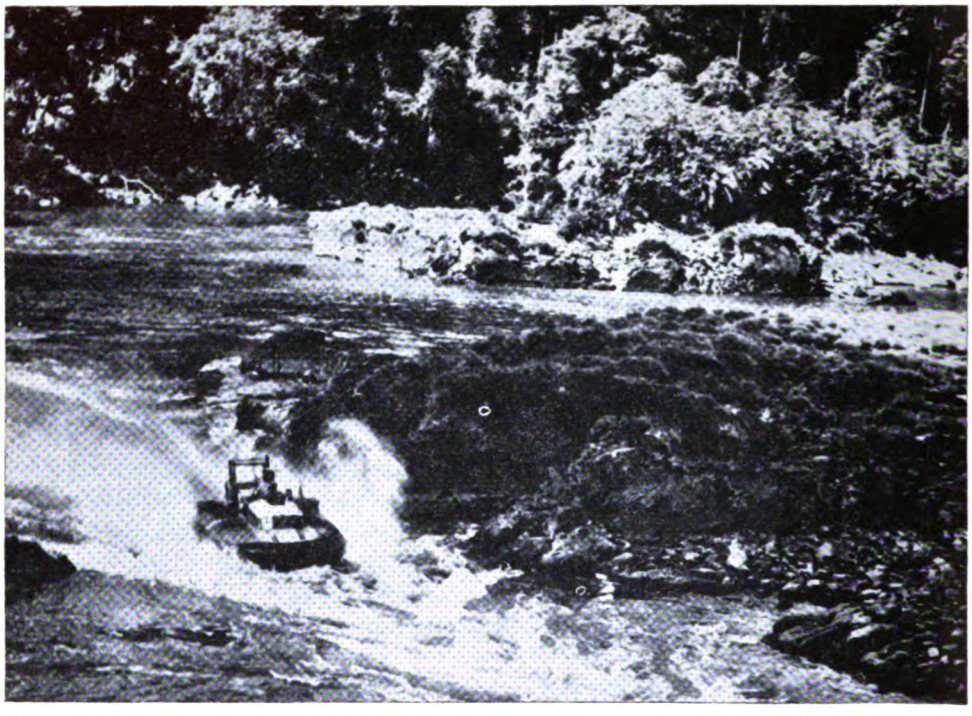

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AUTHORS (Career Notes)

Air Commodore Neil Cameron, C.B.E., D.S.O., D.F.C. was born at Perth on July 8, 1920, was educated at Perth Academy. He joined the R.A.F. Volunteer Reserve in 1939, and during the Battle of Britain flew Hurricanes with No. 17 Squadron. In 1941 he joined No. 134 Squadron at Leconfield, Yorks., which later flew its Hurricanes in Russia. In 1942-43 he was in Egypt and North Africa with No. 213 Squadron and No. 335 Squadron, Royal Hellenic Air Force, and in 1944 commanded No. 258 Squadron (Hurricanes and Thunderbolts) in Burma. In 1956 he commanded the University of London Air Squadron and in 1958-60 was personal staff officer to the Chief of the Air Staff, Marshal of the R.A.F. Sir Dermot Boyle. After commanding R.A.F. Abingdon, Berks., he took the 1963 Imperial Defence College course, and in 1964 became personal staff officer to the Deputy Supreme Allied Commander Europe, Marshal of the R.A.F. Sir Thomas Pike. He became Assistant Commandant (Cadets) at Cranwell on May 1, 1965, and went to his present post as R.A.F. member, Programme Evaluation Group, on the personal staff of the Minister for Defence in October, 1966.

Air Vice-Marshal William Munro Yool, C.B., C.B.E., retired from the R.A.F. in June, 1949. His last appointment was as Air Officer in Charge of Administration at Headquarters, Mediterranean and Middle East Command. Shortly after his retirement he was invited by the Air Ministry to act as Chairman of the Committee in charge of the organisation of the Royal Air Force Display at Farnborough, last year which drew some 130,000 spectators.

Born at Partick, Lanarkshire, A.V.M. Yool was educated in H.M.S. Conway and a few months before his 21st birthday he obtained a temporary commission in the Army. His association with flying dates from early in 1917.

He graduated at the R.A.F. Staff College in 1929 and after two years in Iraq and other duties, he was appointed an instructor at the Staff College in 1936. He was a wing commander at the outbreak of the second world war and left the Staff College in September, 1939, for air staff duties with a special mission to France, being appointed to an administration post at the headquarters of the British Army Air Forces in France in the following January. Returning to England in June, 1940, he became Senior Air Staff Officer at the headquarters of No. 6 Group for two months before going to the Air Ministry (Directorate of Plans). In April, 1941, he became Personal Staff Officer to the Chief of the Air Staff (Air Chief Marshal Sir Charles Portal who is now Lord Portal of Hungerford) and was Director of Organisation at the Air Ministry for two years from July, 1942. He was appointed Air Officer in charge of Administration at H.Q., Technical Training Command in

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August, 1944, and held this post until he went to Headquarters, Mediterranean and Middle East Command in a similar capacity in April, 1947. Director, Auxiliaries, Reserve and Air Cadets, in the Dept. of the Air Member for Personnel, until 1954.

Air Vice-Marshal E. J. Kingston-McCloughry, C.B., C.B.E., D.S.O., D.F.C., M.A.(Cantab), R.A.F.(Retd.) Fought in the trenches in the Somme in 1916 and later in the same year joined the Royal Flying Corps. He took an engineering honours degree at Trinity College, Cambridge, where he was a contemporary of King George VI. His literary trend was early established by winning a R.A.F. Prize Essay which brought him to the notice of Lord Trenchard. He graduated from the R.A.F. Staff College in 1929 and from the Army Staff College, Camberley, in 1935. He commanded No. 4 Squadron and later became Assistant Commandant at R.A.F. College, Cranwell. In 1942 he was appointed A.O.C. No. 44 Group, and Head Air Operational Planner in A.E.A.F. for "Overlord" in 1944. He was Air Member Frontiersation Committee India in 1944, and also Air Member Re-Organisation Committee, India, 1945; in addition he was S.A.S.O. Air Headquarters, India. Was A.O.C. No. 18 Group, Coastal Command and Senior Air Officer Scotland, 1947-48, and S.A.S.O. H.Q. Fighter Command in 1950. A tour of duty as A.O.C. No. 38 Group 1950 gave way to his appointment as Chief Air Defence Officer in the Ministry of Defence, 1951-52, a post which because of its absorbing interest was a fitting culmination to a career that made the most of thought as well as action.

BRIEF CAREER NOTES OF OTHER AUTHORS

The brief career notes of the undermentioned authors, who have contributed articles to this number of the R.A.F. QUARTERLY, were published in our previous issue, Summer Number, 1967; Vol. 7, No. 2.

Air Marshal Sir R. Saundby, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L.

Dr. C. L. Wayper, M.A., Ph.D.

Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F.(Retd.)

Wing Commander J. F. L. Long, M.A., R.A.F.(Retd.)

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THE FIGHTER PILOTS

A Comparative Study of the Royal Air Force, the Luftwaffe and the United States Army Air Force in Europe and North Africa, 1939-45.

EDWARD H. SIMS

This original and objective analysis of the great fighter campaigns of the last war by a former fighter pilot examines in detail the true odds between the R.A.F., the Luftwaffe and the U.S.A.A.F. in Western Europe, assesses for the first time their contribution to the war effort of each nation and the effective value of the great air aces. Particularly interesting in a fascinating and authoritative book are the personal accounts of the most interesting single missions of the aces of three nations coaxed by the author from each pilot, checked by them and compared with the combat reports.

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Book Reviews

Handling the Big Jets. By D. P. Davies (Air Registration Board, London; 247 pp.; illustrated 30s.)

The author of this book is Chief Test Pilot of the Air Registration Board. As such, he has been responsible for the certification flight trials of most British civil prototypes since the world's first jet airliner, the Comet, in 1950. His experience totals more than 4,000 hours on 140 different types, ranging from ultra-light single-seaters to Super VC10s, and including gliders and helicopters. There could be no better guarantee of the authenticity of this book.

In his Preface, Mr. Davies comments: "It was never my intention to become an author — I was perfectly happy sculling along as a certification pilot just flying aeroplanes. But as the years went by I realised that a lot of basic flying experience on a wide variety of types was bound to accumulate in the flight test department of any certification authority and that it was wrong, in a broad sociological sense, that this experience should remain in such a tight circle. I felt . . . that the information should be made available to airline pilots. It was partly because of this that I started to give a series of talks to various interested organisations . . . After one such talk, it was suggested that I should put pen to paper and deal with the significant differences in flight handling qualities between the 'big jets' and the traditional piston-engined transport aircraft; this I agreed to do. It was some task and one which I am not anxious to repeat."

Unfortunately for Mr. Davies, the book he has produced is so lucid and valuable that his chances of escaping a contract for a follow-up on "Handling the Supersonic Airliners" seems negligible.

It can be argued that **Handling the Big Jets** is too late — that it should have been available when the 707s, DC-8s, VC10s and similar types first began to enter airline service. But this overlooks the fact that new pilots are being trained continuously to handle such aircraft. Also, the old-timers must learn to cope with new developments — not only physically but mentally when these include such controversial devices as the stick pusher which, for the first time, takes ultimate control out of the captain's hands.

Mr. Davies not only describes what the stick pusher does, and why, but puts over the facts in such a positive way that further argument against the device is unthinkable. That is only one of the reasons why his book is as applicable to the most experienced captain as to the youngest pupil of the College of Air Training.

It is no less valuable to anybody who wants a thoroughly up-to-date and easily-understandable manual of aerodynamics. Far too many of the books now on the market have yet to catch up on things like variable-incidence tailplanes, and no book that the reviewer has seen previously has explained so clearly phenomena like the change in effective thickness/chord ratio with yaw on a swept wing, with consequent very marked rolling tendency.

At first glance, this book seems so easy to understand compared with other textbooks on aerodynamics that one suspects over-simplification. It is an illusion created by clear writing, absolute mastery of the subject and superbly conceived and executed illustrations. As a contribution to greater safety in the air — which is a prime reason for the ARB's existence — it is worthy of the very widest readership.

J.W.R.T.

The Breaking Wave, by Telford Taylor (Weidenfeld & Nicolson, London; 378 pp.; illustrated; 50s.)

Why was the Summer of 1940 the turning point in World War II. We, in Britain, tend to think it was because the R.A.F. won the Battle of Britain. Mr. Taylor prefers to believe that the war was lost on the other side of the Channel rather than won on this side. "For all the

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glamour of those encounters in the English skies and for all the heroism of the Few," he believes that the German side of the story is the more interesting strategically and significant historically, and attempts to show that German miscalculations, hesitations and mistakes saved Britain, rather than Spitfires and Hurricanes.

Such a thesis is likely to make the average reader of this journal hot under the collar, especially as Mr. Taylor is an American. However, **The Breaking Wave** should not be prejudged, in accordance with one's own beliefs. All the bravery and skill of the R.A.F. might not have saved these islands had Hitler attempted an invasion immediately after the defeat of France. In any case, wars **are** lost as well as won, and there is little doubt that the well-equipped German military machine suffered from the intuition of the warlord who was in absolute command, and from a complete conflict of opinion between the leaders of the Army and Navy.

Flushed with the success of its **blitzkrieg** tactics, the German Army viewed Operation Sea Lion (the invasion of Britain) as the quickest road to final victory and regarded Operation Eagle (the air attack on Britain by the Luftwaffe) as simply a preparatory measure. The German Navy, on the other hand, considered Sea Lion suicidal, and regarded Eagle as the opening round in a sustained offensive by air and sea which, by destruction and blockade, would bring Britain to her knees without ever landing a German soldier on English soil. Goering tended to agree with the Navy view. Hitler, it seems, encouraged both Eagle and Sea Lion without making them part of any considered overall strategy.

In the event, we are told by Mr. Taylor, the Battle of Britain (Eagle) was executed but never planned, while the invasion (Sea Lion) was planned and prepared but never executed.

As one reads his scholarly book — and it is both scholarly and readable — one's preconceived notions gradually disappear. His arguments are sound, and one soon realises that this is no cockshy by an American trying to belittle a British achievement, but a real and valuable contribution to studies of World War II history, looked at from a refreshing, new angle. One may not agree with all of the author's conclusions or lines of reasoning; but there is certainly nothing anti-British in the approach, and the overall tribute to the R.A.F. and to Britain's great wartime leader is summed up in his verdict on Operation Eagle:

" The Battle of Britain was not won by the brilliance of a field commander. It was a triumph of professional competence in the higher ranks of the Royal Air Force and the civil service, and of gallantry on the part of a few thousand young men inspired by the desperate plight of their country and the personal example of one of the greatest war leaders of all time. Winston Churchill sang of the Battle of Britain even as it was being fought. As the pages of history turn and the details of the Battle fade, it is his name that will symbolize all the heroes of Britain's finest hour."

J.W.R.T.

Mosquito, by C. Martin Sharp and Michael J. F. Bowyer (Faber and Faber, London; 494 pp.; illustrated; 84s.)

One could say, quite simply, that this is a superb book about a superb aircraft. It deserves, however, a lot more than fifteen brief words of comment.

Even a quick 'skim' through the book will show that it is beautifully produced, extremely well illustrated, and that the research involved in the 89 pages of appendices alone would be more than enough to deter most people from attempting to compile such an encyclopaedia of knowledge for a single aircraft. But perhaps it is presumptious to even consider the Mosquito as a 'single aircraft.'

The first words of this book's introduction paints the broad picture: " The Mosquito was the outcome of a revolutionary concept which held that, on a given engine installation, a bomber would be so much faster if relieved of defensive guns and gunners and the structure and fuel load needed to carry them, that it would be safer, and would perform more efficiently. In the 1930's this was contrary to accepted policy."

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In the ten chapters which follow, the authors tell of the struggle to gain acceptance of this new concept, of the development problems and of production — on an enormous scale — not only in Britain, but in Canada and Australia also.

The chapters which follow tell, in remarkable detail, of the whole operational life of the Mosquito, from the moment that the first enemy aircraft was destroyed by 157 Squadron on May 30, 1942, to the time, almost three years later when, on 2—3 May, 1945, the final missions of Operation Manna were flown. Four Mosquitoes of 105 and 109 Squadrons marked aiming points in Holland so that Lancasters could drop desperately-needed food supplies to the near-starving Dutch.

Between these two events, Mosquitoes had more than fulfilled every new task imposed upon them: in 1943 the fighter versions largely took over the night defence of Britain, claiming 659 enemy aircraft by November, 1944; they intruded throughout Europe as fighters and fighter-bombers, by day and night, affording army support, destroying enemy aircraft on the latter's own bases, disrupting transport, smashing industry. They formed an economical light night striking force, were accurate pathfinders for many of Bomber Command's most important attacks. They even found limited use with BOAC as "airliners." You name it, they did it!

The appendices of this book alone warrant a complete review; suffice it to say they present the most complete and detailed picture of any wartime aircraft.

The ubiquitous Mosquito will long be remembered: Wing Cdr. Wooldridge, D.F.C., tells of ". . . the memory of racing across the Hague at midday on a bright spring morning, while the Dutchmen below hurled their hats in the air and beat each other over the back. All these are unforgettable memories. Many of them will be recalled also by the peoples of Europe long after peace has been declared, for to them the Mosquito came to be an ambassador during their darkest hours."

There is little doubt that those who read this book, whether they served on the ground or in the air, will find their own memories of the "Mossie" come crowding in. D.C.M.

Aeroplane Directory of British Aviation (Temple Press Books, London; 558 pp.; 50s.)

Why on earth should anybody want to write or read a review of the **Aeroplane Directory?** Can there be anybody, anywhere, who does not regard it as the absolutely indispensible guide to who does what, who's where, who's who and what's what in British aviation? Most of us use the book so much that it is difficult to imagine a time when it was not there, on the shelf, to answer queries and provide an instant address/telephone number service.

There is one interesting innovation this year — the first of a series of anonymous Prefaces to be invited annually from organisations or individuals prominent in British aviation. It is the only part of the book which already reads like past history! The author comments "It was to be expected that a change of government two-and-a-half years ago would bring changes in aviation; but how drastic these would be could not have been accurately foreseen even by the boldest prophets." How true . . . how true . . . as becomes clear when one reads a little further on in the Preface: "If the European air bus can be decided upon in addition to the Anglo-French variable-geometry aircraft, new heart will be put into the British aerospace industry." What variable-geometry aircraft? The one "finally agreed to by the two governments on January 16 this year"? Unfortunately, as with the TSR.2, P.1154, HS.681, Blue Streak missile, Skybolt, etc., that was before the latest "now you see it, now you don't" act by the conjurors in our Ministry of Defence.

There won't be any new heart in our industry until we have people in government who believe in aviation, and more people in industry who are as interested in making aeroplanes as in making money. Despite which, **The Aeroplane Directory** continues to find plenty to record, with its usual high standards of accuracy and clarity. Long may it do so, and long may there be a British industry to record. J.W.R.T.

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Wings of Fate, by Norman Macmillan (Bell, London: 191 pp.; 21s. net). Norman Macmillan is the author of "INTO THE BLUE" and subsequent books on his flying experiences. He has spent a lifetime flying in the R.F.C., R.A.F., as a test pilot and freelance pilot, all of which have been packed with adventure.

His latest book "WINGS OF FATE" is a series of short stories. One describes events during operational flying in World War 1 (1915-16) and three concern civil flying between the two World Wars.

His first story is somewhat macabre and it is clear that the author is a believer in the occult. Whilst a test pilot he senses something sinister about a monoplane being prepared for the R.A.F., to try and capture the long distance non-stop flight record and his refusal to go on testing it causes some friction between himself and the Air Ministry. When the record attempt is made it ends with the deaths of Flight Lieutenants Jones-Williams and Norman Jenkins.

The second concerns Oscar Greig a pilot in No. 5 Squadron and describes how, when flying on operations in France in 1915, his "Vickers Gun-Bus" becomes uncontrollable in a "spin", leaving nothing to the imagination regarding the fear and courage of the pilot and his observer, as they hurtled down to what seemed certain death, but ended in both stepping out of the crash shaken but unhurt. The full and detailed description of that historical aircraft the "Vickers Gun-Bus" is most interesting, which he says was armed with a Lewis gun. (As one who flew in them, I seem to remember being armed with a .303 rifle before machine guns were issued.) In 1916 Greig joined No. 25 Squadron and there follows another excellent full description of that other museum piece the F.E.2b. The account of von Richthofen's activities at that time is most interesting also, as is the story of Greig being shot down by him over enemy territory and subsequent experience as a prisoner of war.

Another story concerns Macmillan's experiences as a freelance and details of delivering a "Bristol Fighter" to Novisad (Near Belgrade). To young men of today, with no knowledge of the vicissitudes of these ancient planes, this flight should be of the greatest interest to them, as will be the amount of adventure that accompanied it on so comparatively short a cross country flight.

The final story includes brief accounts of Macmillan's involvement in an attempt to fly round the world in a "Fairey" floatplane, which ended in being marooned in the Bay of Bengal; F. R. Machin's Croydon-Cairo return flight in a "Bristol Bloodhound" and later his disappearance over the Atlantic, when navigating the "St. Raphael", piloted by Leslie Hamilton with Princess Lowenstein-Wertheim as a passenger.

Here are nostalgic memories for old boys of 70 and an account of "when flying really was flying" with each flight packed with adventure to be studied by the very young. A.H.S.

Instruments of Darkness, by Alfred Price (William Kimber, London; 254 pp.; 37 illustrations; 16 Diagrams; 63s. net). With a "Foreword" by Sir Robert Cockburn, K.B.E., C.B. (Director of R.A.E. Farnborough).

Modern war is now dominated by air power, which permeates every phase of the conflict. Success is more than even dependent upon scientific discoveries. The country which is first with a new invention to which the enemy cannot readily find a countermeasure, will have a valuable advantage until he does so; it was ever thus.

This book deals chiefly with the remarkable developments in the fields of radio and radar communications, used in early warning and detection, navigation, target identification and weapon guidance.

The author, an electronics specialist, must have gone to endless trouble and research to provide such a complete and readable story of each stage and development, by British and Germans alike, in recounting the battle of wits which enabled each to match the other over varying periods. In war it is clear that the country which can develop new scientific equipment, unknown to their enemy or who has no countermeasure, has the better chance of victory.

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It is fascinating to read in detail the invention and use of such strange sounding weapons as Freya, Wurxburg and Lichtenstein, Mandrel, Tinsel and Window and of the battles fought by brave men, British and German alike, by whose self-sacrifice and skill the success of these inventions depended.

Seldom can an art of war have been so swiftly evolved, yet events since 1945 demand that scientists of all major powers should meet new conditions. In this nuclear age with fantastic speeds of rockets and aircraft time is at a premium, success in keeping ahead of other nations, particularly with countermeasures, is vital to our survival should war ever come.

Undoubtedly there will be a large demand for this book among Service personnel, but there is nothing in it that an ordinary intelligent layman could not understand and every reader will find it vastly interesting. A.H.S.

The Luftwaffe: a History, by John Killen (Frederick Muller Ltd., London; 310 pp.; illustrated; 42s.)

It would, perhaps, be unfair to comment briefly that John Killen's history of German air power in two world wars is lacking in history, detail and continuity. This depends, rather, upon his view of the potential market for a subject which has been well covered by many earlier authors—his own bibliography extends to 39 other books.

If his aim was to produce an easily readable book for a wide market, Mr. Killen has succeeded admirably. He writes with feeling of the characters who mis-muddled their way through a sea of indecision, and for those who regard famous (or infamous) names with awe, it may be interesting to find that they were invested with the same human frailties as men the world over. These same readers will probably find it sobering to conjecture upon the course of the air war if Ernst Udet had not been smitten by the 'Stuka' bug, or if General Wever had enjoyed Hermann Goering's early authority.

The fabric of this book begins with the graceful Taube monoplane — product of a more gentle age — which carried the Imperial German Air Force to war in 1914; it ends in the violence and flame that engulfed those who sought to conquer the world by force. The tapestry is well and colourfully woven and traces, not too deeply, the rise and fall of the Luftwaffe.

If, on the other hand, the author sought to produce a penetrating study of German air power, intended for the student or air historian, then one must criticise a lack of detail and continuity. The book is well printed and produced, though the illustrations are far from outstanding and cover but a small percentage of the aircraft that made up the Luftwaffe scene. An enjoyable book to read, but one unlikely to find its pages well-thumbed as a work of reference. D.C.M.

OTHER BOOKS RECEIVED

Sailor in the Air. The memoirs of Vice-Admiral Richard Bell Davies, V.C., C.B., D.S.O., A.F.C. (Peter Davies, London; 245 pp.; 10 illustrations; 42s. net).

(The foreword is by Air Chief Marshal Sir Arthur Longmore, G.C.B., D.S.O.) A fascinating story of the Service life of a very gallant naval officer's flying career, from 1913 to 1944. A very valuable contribution to the history of naval flying, lightened by many humorous events. Intensely interesting from cover to cover. A.H.S.

Orders, Medals and Decorations, by Paul Hieronymusser (Blandford, London; 256 pp.; 450 photographs printed in seven colour lithography and copious line drawings; 35s. net).

A most valuable reference book on Orders, Medals and Decorations of Britain and Europe.

A.H.S.

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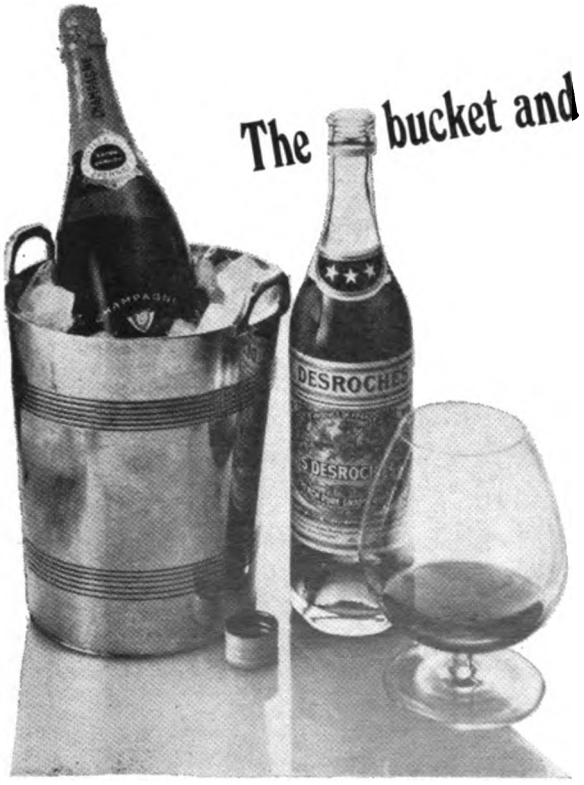

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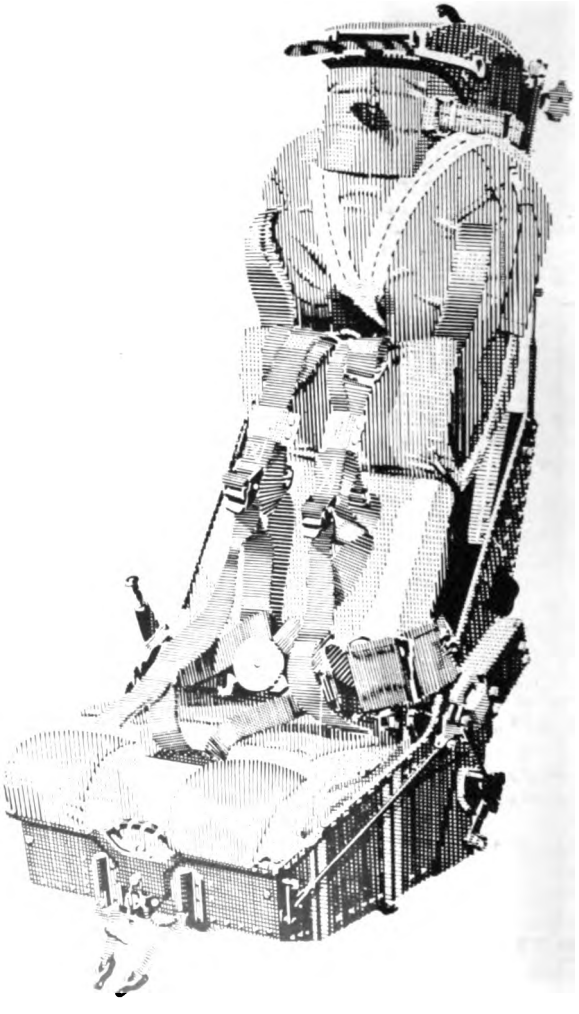

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(*See article on page 255*)

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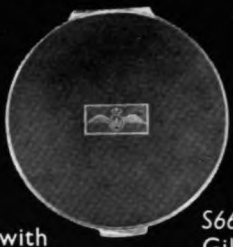

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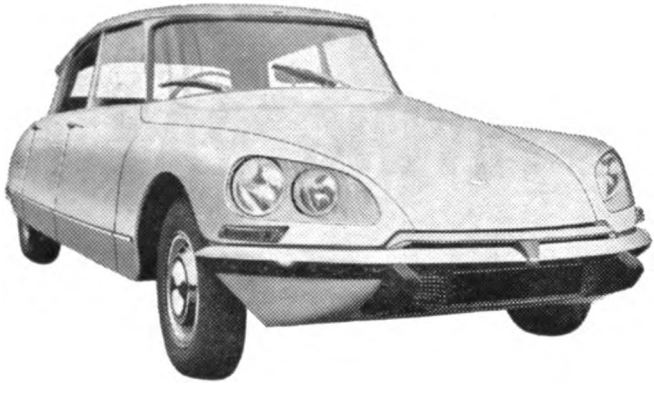

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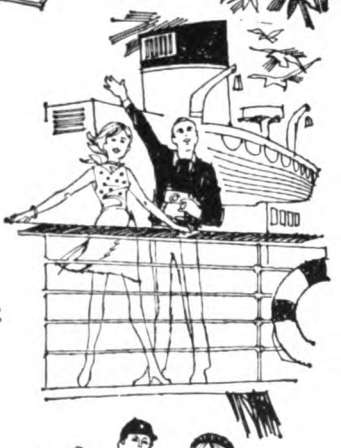

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COVER ILLUSTRATION

Ferret scout cars being driven out of a Hercules; with troops in foreground disemplaned from Andover.

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Paratroops entering an Andover through the rear freight door.
(*Crown copyright photo*)

(*See article "AIR SUPPORT COMMAND" page 255*)

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EDITORIAL

HOW MANY AIR FORCES?

By Air Marshal Sir Robert Saundby, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L.

IT appears from the numerous articles and letters recently published in the Service Journals that the best way of organizing our air power is still, after fifty years, capable of arousing lively controversy.

In his famous speech at Boston in 1949 Sir Winston Churchill said "For good or for ill, air mastery is today the supreme expression of military power, and fleets and armies, however vital and necessary, must accept a subordinate rank." This might have settled the matter, had not the development of the long-range rocket begun to supersede the long-range bomber aircraft as the supreme expression of military power. Ballistic missiles can, of course, be handled by Navies, Armies, or Air Forces. The two older Services saw that if long-range bombardment ceased to be the monopoly of the Air Force, it would be possible to argue that the future task of our air power would be the support of land and sea operations. A case might therefore be made for abolishing the Royal Air Force, and dividing it into Naval and Army Air Arms.

In support of this proposition we have seen a spate of disingenuous arguments, most of them ignoring or perverting the lessons of history, and all of them based on inaccurate or irrelevant premises. It has even been argued that such a division would be unifying rather than divisive, as at present we have three air forces, the R.A.F., the Army Air Arm, and the Naval Air Service. One could, of course, equally well argue that we have three Armies, as the Navy has its Marines and the Air Force has the R.A.F. Regiment. Or that we have three Navies, because the Army has its specialized vessels and pontoons, and the Air Force its flotilla of air-sea rescue craft.

Under a dense smoke cloud of irrelevances and inaccuracies, the basic facts which led to the formation of the Royal Air Force are obscured.

The basic facts are these. By 1917 two things had become painfully apparent. First, the Royal Naval Air Service, especially as regards its fighter squadrons, was virtually unemployed. Apart from coastal patrol, largely undertaken by non-rigid airships, and a certain amount of reconnaissance, there were no Naval tasks for it to perform. Its casualty rate had therefore been very low, and it had been able to expand to a large size. By contrast, the Royal Flying Corps had been in close contact with the enemy throughout the war, its casualty rate was very high, and it had been unable to expand fast enough to meet the ever-increasing demands made upon it. In particular, its fighter squadrons were grossly over-stretched, and we were in danger of losing command of the air over the Western Front.

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Secondly, divided responsibility for the air defence of this country had precluded the setting up of an effective centralized organization.

It was in these circumstances that the Prime Minister of the day, Lloyd George, asked General Smuts, a statesman of outstanding ability and the highest repute, to survey the whole problem and advise on the best means of organizing our air power. Smuts reported in favour of unification, as the only possible way of rectifying a state of affairs that had become intolerable. His recommendations were accepted, and the Royal Air Force was formed on April 1st, 1918.

With regard to this decision, one very important point should be noted. At that time, our air power was solely engaged in the support of land and sea operations. This fact had no bearing whatever on the vital need to end the waste, misuse, and inflexibility inseparable from the existence of Naval and Army air forces.

It is true that the opportunity was taken to set up a small Independent Bomber Force, which never had more than 11 squadrons out of a total of some 230, but this was no more than a small-scale experiment, though it contained the seeds of a great development in later years. It was not, however, the main, or even a significant, reason for the unification of the R.N.A.S. and R.F.C. It was a minor consequence of it.

The reasons which led to the formation of the Royal Air Force are just as valid and compelling today as they were then, whether or not its future role is confined to the support of sea and land operations.

If you pull an Air Force to pieces you rob it of its two main assets, its flexibility and power of rapid concentration. Also, perhaps even more disastrous in the long run, you stifle its future development.

THE R.A.F. QUARTERLY AND OFFICERS CAREERS

It is hoped that those responsible for the training of junior officers will draw their attention to the fact that each number of "THE ROYAL AIR FORCES QUARTERLY" contains articles helpful to them in their preparation for Promotion and Staff College Examinations.

These articles are not only made "Recommended Reading" for these examinations in the United Kingdom, but also in the Commonwealth air forces and those in the U.S.A.

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THE R.A.F. VERSION OF THE VC.10
This can be fitted with 150 seats and also used as a freighter.
(Crown copyright photo)

AIR SUPPORT COMMAND

Aircraft and future role

BY AIR MARSHAL SIR THOMAS PRICKETT, K.C.B., D.S.O., D.F.C.

Introduction

ON 1st August, 1967, a VC-10 bearing the markings of Royal Air Force Air Support Command left Lyneham on a scheduled journey to the Far East. This event was more than an outward sign indicating the birth of a new R.A.F. Command. It could also be seen as an earnest of the new national strategy, with mobility the keyword.

For nearly a quarter of a century Transport Command had been a respected name in almost every part of the world where aircraft could fly. The value of air transport in military operations was established even earlier, and during the First World War there were supply drops to soldiers besieged at Kut, in Mesopotamia, and air deliveries of ammunition for ground attack squadrons in the closing stages of the struggle on the Western Front. In the 1920s air transport became a regular component of the R.A.F. forces overseas, and during the Second World War developed to the extent where some centralised control was necessary, leading to the formation of Transport Command in 1943. In 24 years Transport Command aircraft flew some 500 million miles and carried more than two million passengers.

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Today Britain can no longer afford to maintain large military garrisons overseas; nor is such a policy always desirable or even necessary. Current defence policy therefore aims at the minimum forces overseas, with strong mobile forces based in this country—and the necessary air transport to carry them anywhere in the world in a matter of hours, and to supply and support them in the battle area.

Throughout the recent discussions on a new R.A.F. Command structure, which formed part of the wider review of British defence policy, it was accepted that the United Kingdom-based strategic and tactical transport aircraft, with their responsibilities to support all three Services, must remain within one Command. It was also recognised that the vital offensive support element, working closely with the tactical transport aircraft and with the Army in the battle area, should also be under the same commander. The title Air Support Command was chosen to describe more accurately than "Transport" these varied but closely linked activities, and to emphasise their importance in the national strategy.

Air Support Command is therefore essentially a combat force, being the instrument whereby Britain's land and air forces can be projected world-wide, on a quick reaction basis—carried into action and supported offensively and logistically thereafter. A capability to perform this task efficiently becomes more essential as the process of withdrawal from bases—but not necessarily from commitments—proceeds.

The basic tools required for the job are long-range aircraft to carry troops and equipment to the operational theatre, tactical transports to move them to an airhead closer to the scene of trouble and short-range aircraft and helicopters which can operate from small, rough air-strips in the battle area. Additional requirements are an air-drop capability and a versatile offensive support force.

Re-equipment and Redeployment

A substantial expansion programme, involving almost complete re-equipment and some redeployments, initiated well before the formal adoption of the new Command title on August 1st, is now in progress. The new aircraft, well chosen to fulfil the Command's exacting tasks, range from the VC-10 and the Belfast for the strategic force, to the Phantom and the Harrier for ground attack and offensive support. Especially valuable in providing a new flexibility to all air transport operations will be the versatile Hercules, which is equally effective in the strategic and tactical roles.

The capability of the long-range force, for some years equipped with Britannias and Comets, is being dramatically increased by the introduction of the VC-10, which can be fitted with 150 seats for the trooping role. All 14 ordered will be in service by mid 1968. With three aircraft, leaving the United Kingdom at two-hourly intervals, a troop lift of about 4,000 men to the Far East could be completed in about a week, compared with the 15 days required by the same number of Britannias. The VC-10 is rapidly adaptable as a freighter, able to carry such loads as five Ferret scout cars, or five Landrovers and trailers. The Britannia, a reliable passenger-cum-freighter workhorse, will remain in service for some time to come, and the Comet will be usefully employed on special flights.

The 100-ton Belfast freighter is a very useful addition to our strategic fleet,

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A Wessex helicopter being loaded into the capacious freight hold of a No. 53 Squadron Belfast.
(Crown copyright photo)

particularly in the carriage of bulky military equipment. It has already demonstrated its capacity and value in redeploying Whirlwind helicopter units from Guyana and Borneo to England, and by moving the larger Wessexes—two at a time—between England, Cyprus, North Africa and Germany.

Brize Norton is the base for the VC-10s and Belfasts, and the Britannias will move there from Lyneham in 1970, when additional facilities have been installed.

The tactical elements of Air Support Command, under No. 38 Group, are undergoing a comparable transformation. By next summer No. 38 Group will have the full force of four Hercules squadrons representing a lift and deployment capability about six times greater than that offered by the piston-engined Beverley and Hastings force.

The Hercules is a rugged aircraft which has proved its value in the U.S.A.F. and other air forces all over the world. The R.A.F. version has more powerful engines than earlier models and incorporates much British equipment. As a trooper it can carry 92 men (or drop 62 paratroops). For supply dropping it can deliver 16 one-ton containers or a single heavy platform of more than 30,000 lb., and will be able to employ the recently-developed ULLA (ultra low level airdrop) technique for accurately delivering heavy loads from 20-30 feet. As a military freighter it can accommodate such loads as three Ferrets, or two Sioux helicopters.

The first Hercules squadrons are now forming at Lyneham, and further squadrons when formed will, for a time, use the old U.S.A.F. base at Fairford. In 1970, when

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The short-range Andovers of No. 46 Squadron provide battlefield mobility.
(Crown copyright photo)

Brize Norton is ready to receive the Britannias, Lyneham will become the principal tactical base, housing all the Hercules squadrons.

No. 38 Group's battlefield mobility has been increased by the recent addition of a squadron of the new short-range turboprop Andovers, which can operate in and out of short, unprepared forward airstrips and can also be used for air-dropping. Additionally the number of Wessex and Whirlwind helicopters assigned to No. 38 Group is to be increased. The Argosy will remain in service for some years as a medium range tactical transport aircraft, and the two squadrons at Benson are being reinforced so that they may support a detachment on rotation in the Persian Gulf.

Offensive Support

The offensive support capability of Air Support Command, currently represented by the No. 38 Group ground attack Hunter wing at West Raynham, is also to be greatly increased.

When the projected Hunter replacement, the P.1154, was cancelled it was agreed that no single aircraft could perform all its functions. It was therefore decided that a combination of the Phantom and a developed P.1127 (now known as the Harrier) would be required—the Phantom undertaking the longer-range, day/night and all-weather conventional attack and reconnaissance tasks and the V/STOL Harrier to provide quick reaction from forward locations in the battlefield area. These new offensive support aircraft will present a great challenge to Air Support Command to devise a concept of operations which will exploit their full capabilities. The Kestrel Tripartite Evaluation Trials of 1966 proved the feasibility of V/STOL operations in the field, but until experience is gained in the global operation of the Harrier—due to

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enter service in 1969—the pattern of these operations and the system of logistic support must remain somewhat speculative. It is likely that the conventional airfield terminologies will be inappropriate and that a system on the following pattern will evolve:

a. A Parent Base, being the theatre location on which the Harrier force is permanently based.

b. A Primary Site (possibly at the Tac T (MR) airhead), being the main site of a complex of sites and containing the unit H.Q., operations staff, communications centre and first line servicing and logistics.

c. A Sub Site (possibly at the Tac T (SR) airhead) being associated with the primary site and capable of providing many of the services available at the primary site. Alternatively, or additionally a Sub Site could be located close to the Army formations, operating one or two aircraft, with no support facilities available.

The operation of the Harrier from unsupported sub sites adjacent to the Army formations would clearly provide the most rapid reaction time, but a number of operational penalties would have to be accepted for aircraft operating independently. The employment, deployment and tasking of these aircraft will therefore always require a directive from the highest level and the closest co-ordination between the Army and Air Commanders concerned.

The Phantom is an extremely versatile and sophisticated aircraft capable of delivering in the offensive support role a wide range of conventional stores. It is also a reconnaissance aircraft and, in addition, may be called upon to supplement existing air defence forces where this is necessary. The arrival of these aircraft in the near future will strengthen the offensive capability of No. 38 Group.

The Effects of the Changes

What will be the effect of these changes on the capacity and effectiveness of Air Support Command? The diagram on the next page gives an indication of the improvements in payload and range afforded by the new transport aircraft.

These greater ranges and capacities will obviously enable the Command to deliver a representative military force to its destination in a much shorter time. But it is, perhaps, less apparent that these factors also provide a wider option of routes to the destination areas. Any route structure adopted in the implementation of the national policy must provide not only a timely, but also a reliable, means of moving men and material by air. The routes selected should ideally be unaffected by any artificial barriers raised by overflying rights, and be invulnerable to the changing attitudes of Governments. They must also be supported by an adequate staging post capacity in terms of fuel, stores and airfield facilities. The current CENTO route to the Far East—through Akrotiri, Muharraq and Gan—is well established and is covered by the VC-10 in about 20 hours.

Even a cursory study of possible alternative routes between the United Kingdom and the Far East shows the great advantages of the projected round-the-Cape route. Although this will require additional staging post facilities and impose some operating

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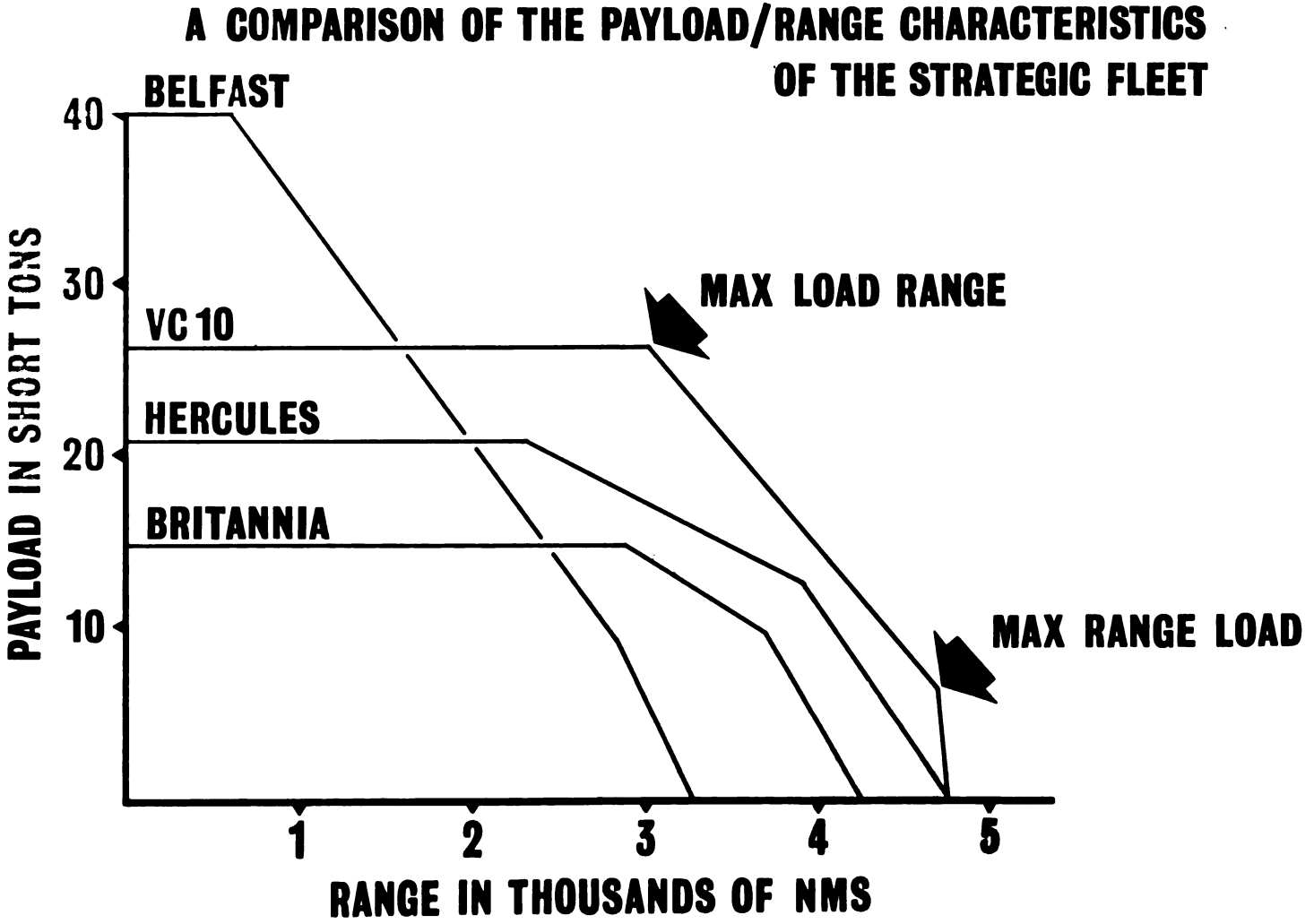

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and payload penalties on the present strategic fleet, it is clearly the only route virtually immune from any political restrictions. Neither can we ignore the advantages of a Westabout reinforcement route to the Far East through Canada, the U.S.A. and the Pacific bases. This alternative also imposes some penalties because of the longer distances and certain necessary route activation, but it would be politically less vulnerable than the CENTO route and is in fact frequently flown by Air Support Command aircraft to maintain experience among the crews.

Air Trooping

To some of those serving in the Royal Air Force, and certainly to large numbers of people outside, Air Support Command is often predominently associated with the maintenance of long-range scheduled services. It may be that this is an indication of the efficiency with which they are operated, and the companionable atmosphere resulting from the fact that passengers, movements staff and crews are all members of the same Service family. In fact these scheduled flights are an almost incidental task of the Command. The large aircraft which must be available for urgent military needs cannot remain idle on their bases until required, and the crews must maintain the highest operating standards over long-distance air routes. It is commonsense—and of considerable benefit to the tax-payer—to employ them productively on air trooping work.

Since April, 1967, we have undertaken an increasing number of air trooping and priority freight schedules. By mid-1968, when the full fleet of 14 VC-10s is available, virtually all of the Far East and Persian Gulf Services, and a large proportion of those to the Mediterranean, previously undertaken by charter, will be flown by Air

Men of the Royal Hampshire Regiment about to board a VC.10 of No. 10 Squadron at Akrotiri, Cyprus, during a mobility exercise.

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Support Command. There will be an almost daily VC-10 service to the Far East. backed up by Britannias, Belfasts and Hercules in the freighter role.

Schedules fly to a regular time-table, operating procedures are in accordance with international standards and catering and passenger handling is managed with professional acumen. The air trooping programme is an ambitious project. It will always be subject to overriding operational demands, many of which cannot be foreseen, and of necessity committed to a system of staging posts and terminal airfields in overseas Commands, all of which have their own local operational commitments and relative priorities. Nevertheless the trooping programme proceeds with considerable success.

The Training Task

But success of this nature can only be achieved by first class training and strict operating rules. There are almost 400 crews in Air Support Command and quite apart from the effort involved in the Monthly Continuation Training of crews, there is a sizeable programme for the conversion of new crews. Looking ahead to 1968, a total of almost 260 new crews will require training; and very soon there will be no less than eight training units within the Command including the three large operational conversion units at Thorney Island (Argosy and Hercules), Coningsby (Phantom) and West Raynham (Harrier).

Commanders-in-Chief Committee (West)

Any discussion concerning the operational tasks and responsibilities of Air Support Command would be incomplete without some reference to the Commanders-in-Chief Committee (West). This Committee was formed in 1962 to further the policy of increased reliance on a Strategic Reserve in the United Kingdom for the reinforcement of overseas theatres. Its members are the C-in-C, Western Fleet, GOC-in-C, Southern Command (shortly to be reorganised as the Army Strategic Command), and the AOC-in-C, Air Support Command, who in their single service capacities are, in the main, responsible for the training and deployment of the forces likely to be engaged in mounting reinforcement operations. The area of responsibility of the Committee is referred to as the "Area of Possible Operations" and consists virtually of all that part of the world which is not covered by Far East Command. The Committee is essentially a planning organisation, responsible to the Secretary of State for Defence through the Chairman of the Chiefs of Staff Committee for the preparation of contingency plans, which include, inter alia, evacuation plans and plans for the protection of British nationals abroad. The planning staffs and secretariat are located at H.Q. Southern Command at Wilton.

The Future

And what of the more distant future? Eventually in the mid 1970s the Britannias and Argosies will have completed their long service and some thought must be given now to their replacement. The tendency is, in military circles, to aim for larger transport aircraft whilst retaining as far as possible a low airfield criteria. The Americans are already anticipating delivery of the Lockheed C5a with a payload of 165 short

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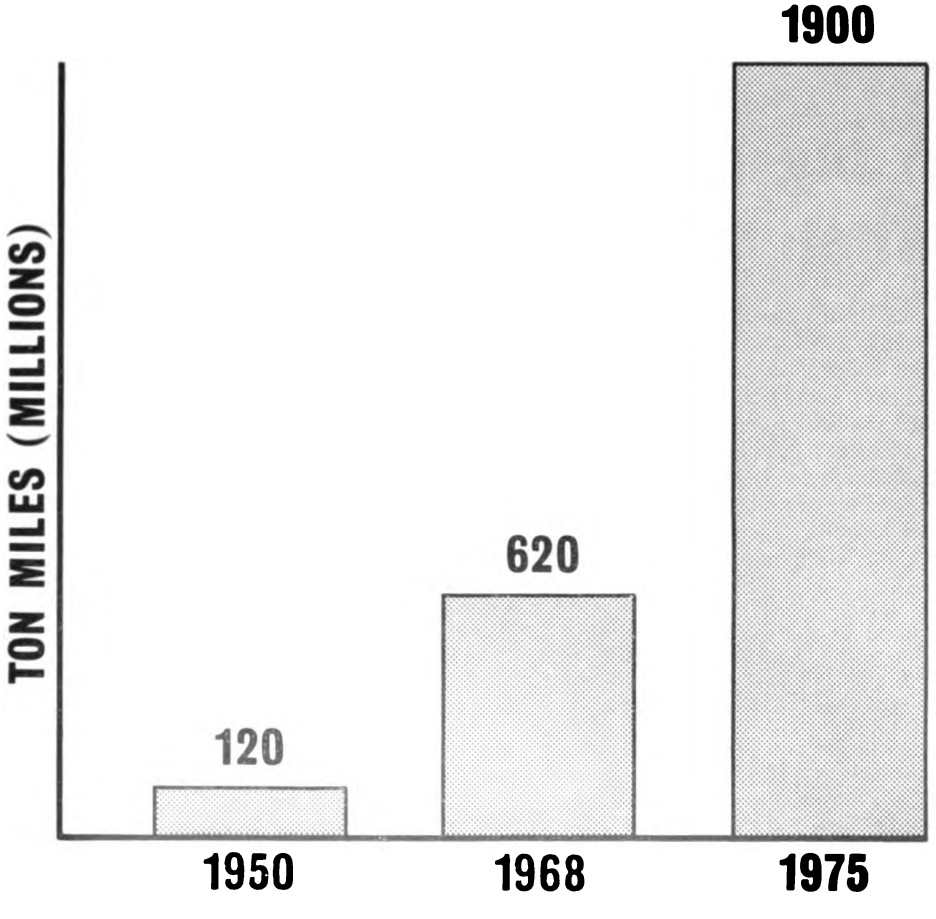
tons over 2,400 miles or 100 short tons over 4,900 miles. I have produced a diagram which illustrates in terms of capacity-ton-miles a comparison of Transport Command as it was at the time of the Berlin airlift and Air Support Command today: it shows a five-fold growth since 1950. As an example a further three-fold growth could be achieved in 1975 by the addition of only fifteen C5a type aircraft to replace the Britannias: and on the offensive support side, the promise of the Chinook and SA 330 helicopters together with the Anglo-French Jaguar will further increase the mobility and striking power in the battlefield area. The potential is enormous.

PAST, PRESENT and PROJECTED – THE GROWTH OF LIFT CAPABILITY OVER A PERIOD OF 25 YEARS



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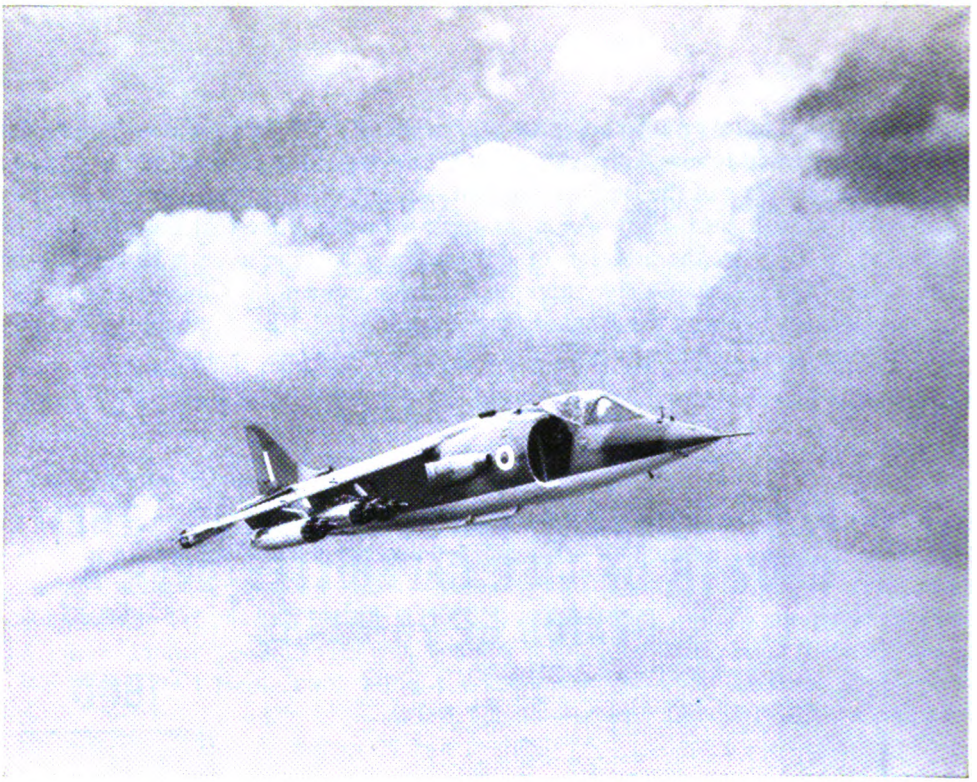

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Two non-Communist military attachés compare notes on first Soviet air show in six years as they stand in front of 201M jet bomber.
(Associated Press photo copyright)

DOMODEDOVO DISSECTED

John W. R. Taylor takes a close look at Russia's newly-revealed combat aircraft for the 'seventies

THE Russians have done it again! It was entirely predictable that they would organise a massive air display this year, to celebrate the 50th anniversary of the Communist Revolution. It was equally predictable that the participants would include a "swing-wing" fighter and an aircraft very like the TSR.2, which was much too good a concept for Soviet designers to ignore. Clearly, too, one had to expect at least small formations of the advanced aircraft shown as prototypes in the last big air display in 1961. Yet, when these aircraft did appear over the airport of Domodedovo, one tended to forget that they represented the products of six years' of work and to feel that Russian air power had some magic ability to renew and revitalise itself overnight.

Predictable or not, there is much that we in the West can learn from the Domodedovo flying display. Back in 1961, Premier Krushchev said that the Soviet Union would build no more strategic bombers, as missiles were capable of providing an adequate deterrent and long-range strike force. The 1967 display confirmed this.

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Except for 22 examples of the supersonic Tupolev Tu-22 (*Blinder*) bomber (of which ten were shown in 1961) the emphasis was entirely on tactical air power.

Blinder itself should not be underestimated. The leading machine of the formation was described by the commentator as "the flagship of the missile-carriers, piloted by Major General Gorbunov." This implies that the Tu-22 is now established as a missile carrier alongside the earlier Tu-16 (*Badger*) and Tu-20 (*Bear*) bombers.

The *Blinder-A* version of the Tu-22, without missile-carrying equipment, has itself been reported in this rôle; but most examples seen at Domodedovo were *Blinder-B's*, with a *Kitchen* missile clasped under their belly. All may, in fact, have been "B's" as a close inspection of photographs of the machines that were not missile-armed, reveals dark patches at the points where *Kitchen's* delta-wing and tail unit would normally be inset in the under-fuselage.

Bearing in mind that the Soviet Union had the 28,660 lb. thrust D-15 turbo jet airborne eight years ago, there seems little reason why the power plants of *Blinder* should not each give well oveer 30,000 lb. of thrust. Indeed, it is difficult to imagine how the aircraft could do its job with less power than this, as it is larger than was once thought.

At Domodedovo, General Gorbunov's flagship was escorted by six MiG-21PF (*Fishbed-D*) fighters. This enabled its overall dimensions to be worked out fairly accurately, as the length and span of *Fishbed* are well known. It transpires that Russia's supersonic strategic bomber is about 130 ft. long, with a span of about 80 ft., making it considerably longer than the R.A.F.'s Victor and Vulcan but with much less wing area. Flight refuelling nose-probes were seen on all 22 aircraft at Domodedovo—a necessity with two such thirsty turbojets, even though almost the entire fuselage is free of engines and weapon-bays and is therefore available for fuel tankage.

Armament, in the shape of a radar-directed tail-gun, was standard on the *Blinders* seen this year.

Reference has already been made to the D-15 turbojet, four of which were fitted in the "201-M" aircraft used to set up a number of impressive payload-to-height records in September-October, 1959. The 201-M was included in the static park at Domodedovo and, to the surprise of most people, turned out to be a variant of the four-jet Myasishchev Mya-4 (*Bison*) strategic bomber, and not the more advanced experimental delta-wing bomber known to NATO as *Bounder*.

This should teach us to take more literally the brief descriptions of aircraft given by the Russians when submitting data to the F.A.I. with their record claims. They described the 201-M as an all-metal *mid-wing* monoplane with four D-15 engines—not very enlightening but subtly different from other types such as the E-66 and E-166 which were described as being *delta-wing* monoplanes. This ought to have suggested that the 201-M was *Bison* rather than *Bounder*.

Experience has shown that the Soviet Union is utterly truthful in what it states in its record claims, even though the information may be tantalisingly sparse. This was confirmed when the mighty *Vostock* space launch rocket appeared at the Paris Air

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Show last May. Western experts had been sceptical for years over the Russian statement that this vehicle was powered by no fewer than six engines, giving a total of 1,322,770 lb. of thrust. Yet this is now seen to be precisely correct, with two engines in the main two-stage rocket and four "wrap-round" booster engines.

Reverting to the 201-M, it differs externally from other *Bisons* only in having an extensively redesigned nose. This embodies a large radar scanner of the kind fitted to many missile-carrying *Badgers* and *Bears*. The nose fairing is large enough to accommodate this neatly, as well as a large flight refuelling probe. The prone bombing/observation station and the domed observation/gunnery windows on each side of the nose are unchanged from the better-known versions of *Bison*, as are the extensive radome and equipment blisters under the nose and centre fuselage.

The fact that the 201-M was included in the aircraft available for inspection on the ground shows that it is not regarded by the Soviet Air Force as being new enough or operationally important enough to reveal anything of material value to Western observers.

By contrast, the aircraft that were of outstanding interest were not displayed on the ground and either took off from a distant runway or simply flew past.

Anyone who predicted earlier that the next Soviet air display would include a variable-geometry (VG) aeroplane and a counterpart of Britain's Hawker Siddeley P.1127 Harrier vertical take-off and landing (VTOL) aircraft were not disappointed. There were, in fact, two VG designs.

The first, which took off and landed at Domodedovo, is a simple conversion of the Sukhoi Su-7 (*Fitter*) single-seat, single-engined tactical fighter which is standard equipment in the air forces of the Soviet Union and many of its allies and friends. Only the outboard 13 ft. or so of each wing has been made movable, with full-length leading-edge slats; the remainder of the airframe is virtually unchanged. A large full-chord fence is situated on each wing at the end of the fixed portion, with an attachment for external stores built into its forward end.

This provision for armament may not be very significant. The aircraft shown at Domodedovo was clearly a prototype, with the kind of paint-scheme that is reserved for experimental aircraft and the equipment of aerobatic display teams. The aircraft gives the impression of having been produced with minimum expenditure of time and money, to provide initial experience of variable-geometry design and operational potential. It must offer a significant improvement over the standard Su-7 in terms of field performance and range—both important in a tactical aircraft. On the other hand, with newer and better aircraft than the basic Su-7 already in production, it would be surprising if the Soviet Air Force felt any strong requirement for this particular VG type.

Second of the VG aircraft was a totally different proposition, and is almost certainly intended to become standard first-line equipment one day. To say that it resembles a scaled-down F-111 does not imply that its designers, led by Mikoyan, have copied the American "swing-wing" aircraft. All current VG fighters are tending to look alike and there are several marked differences between the two machines. As

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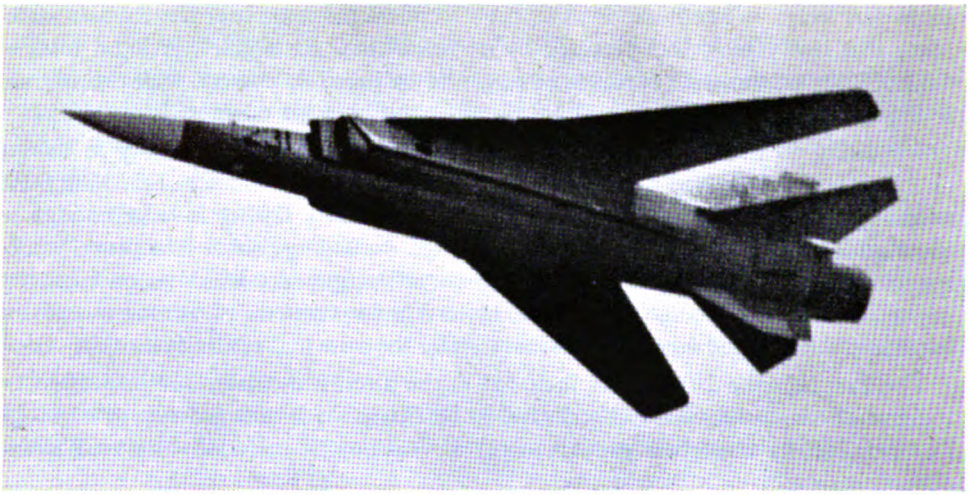

MiG variable geometry fighter.

well as being smaller, the MiG VG has only a single seat and a single large afterburning turbojet.

Its designers seem to have learned something from the troubles that have beset the F-111. For example, its engine air inlets each consist of a basically-rectangular ram intake and large boundary-layer bleed (splitter) plate each side, forward of the wing-root leading-edge; and the gap between wing trailing-edges and tailplane leading-edges is larger than on the F-111 when the wings are fully swept.

The commentator credited this aircraft with the ability to fly at supersonic speed at ground level and Mach 2 at medium and high altitudes. At Domodedovo, it showed that its wings can be changed from the fully-spread to fully-swept position in about four seconds, and then performed a high-speed roll as it flew past. Mikoyan test pilot Hero of the Soviet Union Alexander Fedotov, who flew it, was described as a "heavenly father"; but the VG MiG looks a good workmanlike "pilot's aeroplane" which should present no problems to less-almighty service pilots one day.

Nor was it the only new MiG with obvious combat potential. The major surprise of the show was the sudden appearance of four examples of another new Mikoyan fighter characterised by twin, outwardly-inclined tail-fins. In some respects, notably the wedge air intakes for its two afterburning turbojets, this aircraft resembles the U.S. Navy's Vigilante Mach 2+ reconnaissance-strike aircraft. The high-set cropped delta wing is also reminiscent of the TSR.2 and gives rise to conjecture concerning the aircraft's rôle. The commentator referred to it as a high-altitude all-weather interceptor; yet this wing shape is characteristic of aircraft designed for low-level supersonic strike missions, where low gust response is of primary importance.

There is room between the air ducts for an internal weapon-bay and the curious bulged belly, with a small blister fairing on the port side only, could house an equally useful load of reconnaissance equipment. There also appear to be four underwing positions for external stores. Add to all this a large dielectric nose-cone for radar

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and the fact that the fuselage is large enough to house additional crew members if required, and the new MiG may well prove to be a formidable multi-purpose combat aircraft with a speed of the order of Mach 2.8.

Detail differences in the four aircraft at Domodedovo imply that they were probably from prototype or pre-production batches, but we can expect to see a lot more of what will probably prove to be designated the MiG-23.* It is about 70 ft. long, with a span of about 40 ft.

In recent years, the Soviet Air Force has tended to shun unnecessary duplication, by acquiring only one type of aircraft at a time in any particular category. It would therefore be surprising if *two* new twin-jet single-seat all-weather interceptors were to be put into production simultaneously. Yet a second hitherto-unseen aircraft of this type did put in an appearance at Domodedovo. A single black-painted example flew overhead first, piloted by Vladimir Ilyushin, who is known to be a test pilot for Sukhoi. Next came a formation of nine similar aircraft, none with any visible armament.

Officially-issued Soviet photographs have shown aircraft of this type carrying under their wings a pair of the air-to-air missiles known to NATO as *Anab*. This would suggest that the Sukhoi aircraft is Russia's next-generation all-weather interceptor, already entering production, with the twin-fin MiG following on as the successor to the Su-7 (*Fitter*).

The Sukhoi fighter reflects the traditional—and highly sensible—Soviet economical approach to aircraft development, in that its delta wings and swept tail look little different from those of the current Sukhoi all-weather interceptor, the Su-9 (*Fishpot*). It gives the impression of being a much-refined "twin-engined Su-9", with ram-type side air-intakes instead of nose intakes to make room for a large search radar inside a clean dielectric nose-cone. The intakes are interesting in that, like those of the VG MiG, they have large "splitter" plates of the kind that have proved so successful on the McDonnell Phantom.

Although fast and formidable, the new twin-jet MiG and Sukhoi fighters are reasonably conventional—half-an-hour with a model of the MiG in a wind-tunnel would even explain its unique fin arrangement. But there were other fighters at the show that were far less conventional.

As a start, there were no fewer than three different STOL aircraft, all with vertically-mounted lift-jets in their centre fuselage. The first of them again reflected Russia's minimum-effort approach, as it was an entirely-standard MiG-21PF (*Fishbed-D*) with an extra fuselage section some 4 ft. long inserted aft of the cockpit to house one or two small lift-jets.

Second of the STOL fighters was a variant of the new Sukhoi twin-jet delta with two or three lift-jets inserted between its air intake trunks.

The third aircraft was a single-engined single-seat delta-wing/swept-tail aircraft, also with at least two lift-jets between its engine air ducts. No conventional (non-STOL) version of this machine has been seen, but the front fuselage and tail unit are

* This designation is now known to be correct.

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The new twin-fin twin-engined MiG, which is believed to be a multi-purpose fighter with the emphasis on low-level strike.

A flight of the new Sukhoi twin-jet all-weather ***interceptors each with a*** *pair of "ANAB" missiles under its wings.*

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Fighter with a vertical take-off.

similar in size and general outline to those of the VG MiG. Unlike most of the newer aircraft in the show, it has semi-circular side air intakes, with half-cone centre-bodies, the fuselage being dished slightly forward of each intake.

Whether or not any of these STOL machines will enter service remains to be seen. If the Soviet Union needs to increase the versatility of its tactical air forces by improving their short-field performance—and it would hardly put so much effort into V/STOL developments if this were not the case—then the STOL Sukhoi looks the best bet. With the standard fighter version already in production, it would be easy to set up a parallel assembly line of the STOL model, which appears to differ only in having the lift-jet installation and slightly-extended wingtips which give a compound leading-edge sweep.

There were also two examples of a true VTOL "fighter" at Domodedovo, one complete with two 16-round rocket pods under its wings. Although hailed as Russia's counterpart to the Harrier, the comparison is odious. The Harrier is a brilliantly-conceived, highly-refined, truly-operational aeroplane, developed to its present technological standard via a series of prototype and pre-production versions. The Soviet VTOL (which has characteristics hinting at a Yakovlev parentage) is a quite crude, very "Mk 1" prototype, intended to evaluate the concept and to show that the Soviet industry is capable of producing an aircraft of this type.

Little need be said of it except that it has two turbojets or turbofans in the front fuselage, exhausting via vectored-thrust or deflected-thrust nozzles; puffer-jets at the

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"Fiddler"—Large twin-jet fighter armed with 4 powerful rockets.
(*Novosti Press* **Copyright**)

end of the nose-probe, and at the tail and wingtips for control in vertical and low-speed flight; apparent good stability; and performance in keeping with its uninspiring lines. If the Soviet Union is as interested in VTOL potential as it is in STOL techniques, this particular design will have to give way to something far more sophisticated before the requirements progress to combat-worthy ironmongery.

What else did we learn from Domodedovo, on July 9th, 1967? The answer, in brief, is a very great deal.

When a formation of three of the large twin-jet fighters known by the NATO nickname of *Fiddler* flew over the airport, they were each seen to be carrying four of the big *Ash* air-to-air missiles, instead of two shown previously. Also, the huge ventral fairing seen in 1961 has now been removed. A row of about a dozen "teeth" can be seen projecting beneath the belly of the aircraft and might mean something to an expert on aviation electronics—but, alas, the present writer can do no more than draw attention to them. Only other point worth noting on *Fiddler* is that it is almost certainly a product of Tupolev and not, as thought previously, Yakovlev.

A formation of three of Beriev's M-12 (*Mail*) twin-turboprop maritime-reconnaissance amphibians took off from the airport and flew past. A good close look at them confirmed that they are not merely turbine-powered versions of the old piston-engined Be-6 (*Madge*), but a more-refined design with a small search radar on the nose and MAD (magnetic anomaly detection) tail-sting. Absence of the twin-jet Beriev M-10 (*Mallow*) from this year's fly-past suggests that it is the M-12 rather than the M-10 which is replacing the Be-6 as standard equipment.

An unexpected item in the static park was the E-166 delta-wing aircraft which set up a number of records in 1961-62, including speeds of 1,491.9 m.p.h. over a 100-km closed circuit, and 1,655.93 m.p.h. over a 15/25-km straight course. Powered by a 22,046 lb. afterburning turbojet, it was always assumed to be a development of the MiG-21. It is, in fact, a much scaled-up aircraft on similar lines, with little pretence

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at being an operational design, and was probably produced for high-speed research and as an engine test-bed.

The Yak-28P member of the *Firebar* family included in the static park was also probably a research aircraft, utilised for missile development. Its nose-cone was longer than standard and it had four underwing pylons for missiles instead of the usual two. *Firebars* in the fly-past carried an *Anab* missile under each wing, one with pointed (radar homing) nose and the other with rounded (infra-red homing) nose.

Of the six huge Antonov An-22 (*Cock*) four-turboprop freighters built by mid-1967, three appeared at Domodedovo in military markings. One disgorged three *Frog-3* unguided field-artillery rockets on tracked transporter/launch vehicles and a command car. Another ferried in a similar detachment of the ram jet-powered anti-aircraft missiles known as *Ganef* on tracked launch vehicles.

The eight-seat An-14 STOL light transport appeared in military markings for the first time; so did the 28-passenger Mi-8 twin-turbine helicopter. Missed by many observers was a two-seat tandem-cockpit *Fitter* mixed in with a formation of standard single-seaters.

This, then, was Domodedovo 1967— a show worthy of the 50th anniversary of the Revolution, full of interest and a tribute, particularly, to the imagination and genius of the design bureaus headed by Mikoyan and Sukhoi. On November 7th (still three weeks away as this article is being written), the actual anniversary of the Revolution, we can expect to see an equally impressive display of Russia's missile might paraded through Moscow. Let us hope it will be equally revealing.

John W. R. Taylor from 1941 to 1947 was on the design staff of Hawker Aircraft: from then until 1955 was Fairey's Technical Publicity Officer. Since 1956 Editor of "AIR BP"; Assistant Editor of "JANE'S ALL THE WORLD'S AIRCRAFT" until appointed its Editor in 1959. Author of 119 books on aviation, which included "The History of the C.F.S." for which he was awarded the C. P. Robertson Memorial Trophy in 1959. He has been a regular contributor of articles for many years to the ROYAL AIR FORCES QUARTERLY as well as to all the best known aviation journals.

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THE ARAB-ISRAELI CONFLICT 1967

By Air Vice-Marshal W. M. Yool, C.B., C.B.E.

SELDOM can Napoleon's maxim* that in war the moral is to the material as three to one have been better exemplified than in the latest Arab-Israeli conflict. The war started on Monday morning, 5th June, and by Wednesday evening, 7th June, the fighting was practically over. By then Israel controlled the whole of the Sinai Peninsula, including the Gaza strip and the Straits of Tiran at the entrance to the Gulf of Aqaba, where they seized control of the vital Sharm-el-sheikh islands by a brilliant coup-de-main. In addition they had taken over the old city of Jerusalem and pushed the Jordanian army back to the east bank of the Jordan. In the north they occupied the high ground in Syria, between the frontiers of Lebanon and Jordan, as far as the town of Quneitra. From this area Syria had commanded the cultivated area in Israel to the north of the Sea of Galilee and had constantly harassed the Israelis.

By the sixth day both sides had accepted the United Nations demand for a cease-fire. The Israelis agreed to this because by then they had achieved all their objectives and Egypt, Jordan and Syria also agreed because by then they had no other option, having been overwhelmingly defeated.

The precipitating cause of the conflict was the withdrawal of the United Nations force, which had been demanded by Egypt, from the Egyptian side of the frontier with Israel (Israel has consistently refused to allow U.N. troops on her soil), and from Sharm-el-sheikh where they had been responsible for ensuring that the Straits of Tiran were kept open to shipping using the port of Eilat at the head of the Gulf of Aqaba. The withdrawal of the U.N. force was immediately followed by the re-occupation of Sharm-el-sheikh by the Egyptian army and the closing of the Straits to ships bound for Eilat.

Between the welter of accusations by one side or the other as to who was the aggressor, the re-occupation of Sharm-el-sheikh by the Egyptian army was the crucial factor and looked at impartially the Israelis would have been justified if they did strike the first blow. They would probably have continued to put up with the pin-pricks of the border raids launched from time to time by Syria and Jordan, to which they retaliated in kind, and would probably have been prepared to accept an extension of these minor attacks across the Sinai-Israel frontier after the U.N. force had been withdrawn but the closing of the Straits of Tiran was the last straw.

From the material aspect the balance of forces was greatly in favour of the Arabs, whose forces in theory included those of Egypt, Syria, Jordan, Iraq and Saudi Arabia. Lebanon, although pro-Arab in its official pronouncements, remained neutral. Iraq, apart from sending a brigade to Jordan, did nothing and Saudi

* A la guerre, les trois quart sont des affaires morales, la balance des forces réelles n'est que pour un autre quart.

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Arabia took no action against Israel.

The forces of Egypt, Syria and Jordan presented a formidable array on paper. Their combined armies amounted to some 200,000 men and some 1,600 tanks and self-propelled guns, practically all of Russian make, although Egypt had also a few Centurion tanks. The air forces, with a strength of some 25,000 men, had about 700 operational aircraft, mostly modern Russian MiG fighters, but including about 100 Russian bombing aircraft (Tu-16 and Il-28), and, in Jordan, a squadron of Hunters. There were also a few naval vessels, including 6 destroyers and 9 submarines, none of which appear to have taken part in the war.

Against this large force Israel had an army of some 60,000 men, which could be augmented in a few days by a reserve of about 200,000 men and women (it is doubtful whether, because of the time element, many of these reservists were used), some 650 tanks, mostly American Pattons and Shermans but including a few Centurions, and 250 self-propelled guns. The air force had a strength of 8,000 men and about 350 operational aircraft, all of French design, and consisting mainly of Mirage and Mystère interceptors, but including some 80 Ouragan and Mystère fighter-bombers. They also had a few naval vessels, including 2 destroyers and 4 submarines, although, apart from attacking an American vessel by mistake, the Israeli naval forces, like the Egyptian, appear to have taken no part in the conflict.

In addition Egypt had a number of Russian anti-aircraft missiles and also some 100 surface-to-surface missiles armed with conventional warheads, but none of the latter seem to have been deployed before the conflict started and they are probably still in the development stage. Neither side has nuclear weapons but there are rumours from time to time that they are being developed in both countries.

The conduct of the campaign by the Egyptians was extraordinarily inept, especially in regard to the use of their combined air forces. The Israelis had learnt at the time of Suez in 1956 that they more than had the measure of the Egyptian army but they realised that their rapid advance to the Canal at that time had been greatly aided by the fact that their army was almost free from air attack, because the Egyptian air force had been practically eliminated by the British and French attacks on the Egyptian air bases. Although the Israeli air force was designed in the main to support their army, they fully appreciated the lessons of the 1956 campaign in regard to the value of air superiority.

The first Israeli action, at dawn on the morning of 5th June, was therefore to attack the Egyption and other air bases and within a couple of hours the enemy air forces had been almost completely destroyed on the ground. As in 1956 the Egyptian air force was again caught napping on its airfields, and no measures for dispersal of the aircraft or manning of the anti-aircraft defences appear to have been taken. The sweep of the Israeli army through Sinai and on the other fronts was then able to proceed uninterfered with by any Arab aircraft, whilst their own army had full air support. Their almost complete air superiority, coupled with the higher morale and infinitely better handling of their land forces, contributed largely to the Israeli victory.

Within three days the Egyptian army, to all practical purposes, had been destroyed

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and the Sinai desert was littered with Egyptian tanks, guns and other equipment, which in many cases had been abandoned undamaged by their crews. But the worst aftermath was the thousands of Egyptian soldiers who, with no means of transport and no food or water faced a lingering death in the desert. The Israeli army, aided later by the International Red Cross, came to the succour of many of these stragglers and transported them to the Canal but nevertheless there must have been heavy losses, probably many more than in the actual fighting, where casualties do not appear to have been heavy on either side, though no official figures have been published by the combatants.

On the Syrian and Jordanian fronts the Israelis gained their objectives with equal rapidity and neither country offered serious resistance to the Israeli forces.

As a result of her large territorial gains Israel has now saddled herself with the task of dealing with the refugee problem, which had hitherto fallen mainly upon Egypt and Jordan. During the war between the Jews and the Arabs in 1948, which preceded the setting up by the Jews of the state of Israel, some 400,000 of the Arab inhabitants of the former Palestine left their homes, driven out according to the Egyptians, instructed to leave their homes by Egypt say the Jews, but probably a combination of the two. These refugees were concentrated mainly in the Gaza strip or in the Jordanian territory to the west of the Jordan, which the former state of Transjordan had seized during the 1948 war. Since then the number of Arabs living in both areas has grown considerably, amounting to well over a million people in all, and of these some 250,000 were still classified as refugees. The feeding and housing of the refugess in both areas was the responsibility of the United Nations Work and Relief Agency before the latest campaign and they have since re-assumed this responsibility. A new refugee problem has however been created, in that some 150,000 or more Arabs left their homes on the west side of the Jordan and fled across the river to the east side, thus creating a major refugee problem in Amman itself where many of them arrived.

Looking too far back into the past is usually an unprofitable exercise but the Arabs have right on their side when they claim that their lands were given to the Jews without their agreement. This is historically correct. The Balfour Declaration of 1917, which promised that a Jewish national home would be set up in Palestine after the war, was only one of several dubious measures adopted by the British Government during the first war, such as the Sykes-Picquot secret agreement with France over the future of Syria, to further the allied cause. The fundamental reason behind the Balfour Declaration was not the promotion of the welfare of the Jews but the rallying of World Jewry to the allied cause. The Declaration was accepted by the Arabs at first, on condition that their wishes in regard to other regions, including Syria, were met. These conditions were not fulfilled and the Declaration has been consistently disowned by the Arabs ever since. Most of the troubles in the Middle East since that time have stemmed from the Declaration and Britain has therefore the main responsibility for the present situation. But, equally with the Arabs, the Jews cannot be blamed, and it is fruitless at this stage to demand, as the Arabs do, the return of the whole of the old Palestine to their control.

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In this confused situation it is difficult to disentangle right from wrong, but it is worth remembering that when the state of Israel was formed in 1948, the area taken over and occupied by the Jews was roughly the area proposed by the United Nations for the partition of Palestine, which had been accepted by the Jews and rejected by the Arabs. Jerusalem however was an important exception. The United Nations had proposed that it should be made an international city, but it was, in the event, divided between the Jews and the Arabs of Transjordan. The Old City, containing most of the holy places, was occupied by Transjordan, which also seized the territory to the west of the Jordan up to and including the Old City and the country as a whole was renamed Jordan. Israel has now occupied by force of arms territory which had been seized by force of arms by Transjordan in 1948.

A U.N. proposal that observers should be stationed on both sides of the Canal to report on breaches of the cease-fire was accepted by both sides and the observers started work on 17th July. The observers have no authority however to enforce the cease-fire. Minor incidents continue to occur and there is no prospect of an early opening of the Canal. Israel will not agree to its reopening unless Israeli shipping is allowed to use it and there is little likelihood of Egypt agreeing to this in the near future. The present stalemate is therefore likely to continue indefinitely. In the meantime Israel is planning first road and then rail transport to connect the Mediterranean with Eilat and thus circumvent the closing of the Canal, although it will obviously be years before such a route could be developed on a significant scale.

The long term future of the area is obscure. It is reasonably certain that Israel will not give up any of the additional territory which she now holds and that she will become stronger militarily than ever. The greatest danger is therefore likely to come from the possession of nuclear weapons by either or both sides. In the last conflict there was little or no bombing of the major cities. Such damage as was caused in Jerusalem for instance was mainly the result of artillery fire. But once nuclear weapons were available there would always be a temptation to use them, with all the incalculable consequences that might spring from such action.

No. 216 SQUADRON HISTORY

On 1st April, 1968, this Squadron celebrates its 50th Anniversary as an R.A.F. Squadron.

To assist in the issue of a complete history of this unit on 1st April, 1968, it is requested that ex-members will send (as soon as possible) any information they have to: Flight Lieutenant M. J. R. Lanng, 216 Squadron, R.A.F. Lyneham, Wiltshire.

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BRIEF CAREER NOTES OF CONTRIBUTORS

Air Marshal Sir Thomas Prickett, A.O.C.inC. Air Support Command.

Air Marshal Sir Thomas Prickett, K.C.B., D.S.O., D.F.C., became Air Officer Commanding-in-Chief, R A.F. Transport Command (subsequently re-designated "Air Support Command" on 1st August, 1967) on 27th January, 1967, in succession to Air Chief Marshal Sir Kenneth Cross.

Sir Thomas Prickett was previously A.O.C.in-C. Near East Air Force, Commander British Forces Cyprus and Administrator of the Sovereign Base Areas in Cyprus.

Born at Lindfield, Sussex and educated at Haileybury, he joined the RA.F. in 1937. He was a bomber pilot during the war, winning the D.F.C. in 1942 when flying Wellingtons with No. 148 Squadron in the Mediterranean theatre, and the D.S.O. a year later with No. 103 Squadron, Bomber Command, flying Lancasters against European targets. Later he commanded a British flying training school in the U.S.A. and served with the R.A.F. delegation in Washington.

Since the War he has commanded R.A.F. Tangmere, served on the air staff of Middle East Air Force Headquarters, and commanded a wing of the 2nd Tactical Air Force in Germany. He took the 1956 Imperial Defence College course, becoming Chief of Staff, Air Task Force for the Suez operation later that year. He then joined the Air Ministry as a Dirctor of Policy, and was Senior Air Staff Officer, No. 1 Group, Bomber Command, before returning to the Air Ministry as Assistant Chief of the Air Staff (Operations) in 1960.

Sir Thomas is married, with two children — a son and a daughter.

Brief career notes of the undermentioned contributors to this number, have already been published in earlier issues of this Journal as shown:—

AIR MARSHAL SIR ROBERT H. M. S. SAUNDBY. Vol 7, No. 2, page 151.

AIR VICE-MARSHAL WILLIAM MUNRO YOOL. Vol. 7, No. 3, page 243.

AIR VICE-MARSHAL E. J. KINGSTON-McCLOUGHRY. Vol. 7, No. 3, page 244.

WING COMMANDER R. F. PEMBERTON. Vol. 7, No. 2, page 154

WING COMMANDER J. F. L. LONG. Vol. 7, No. 2, page 154.

J. R. HICKMOTT. Vol. 7, No. 2, page 108.

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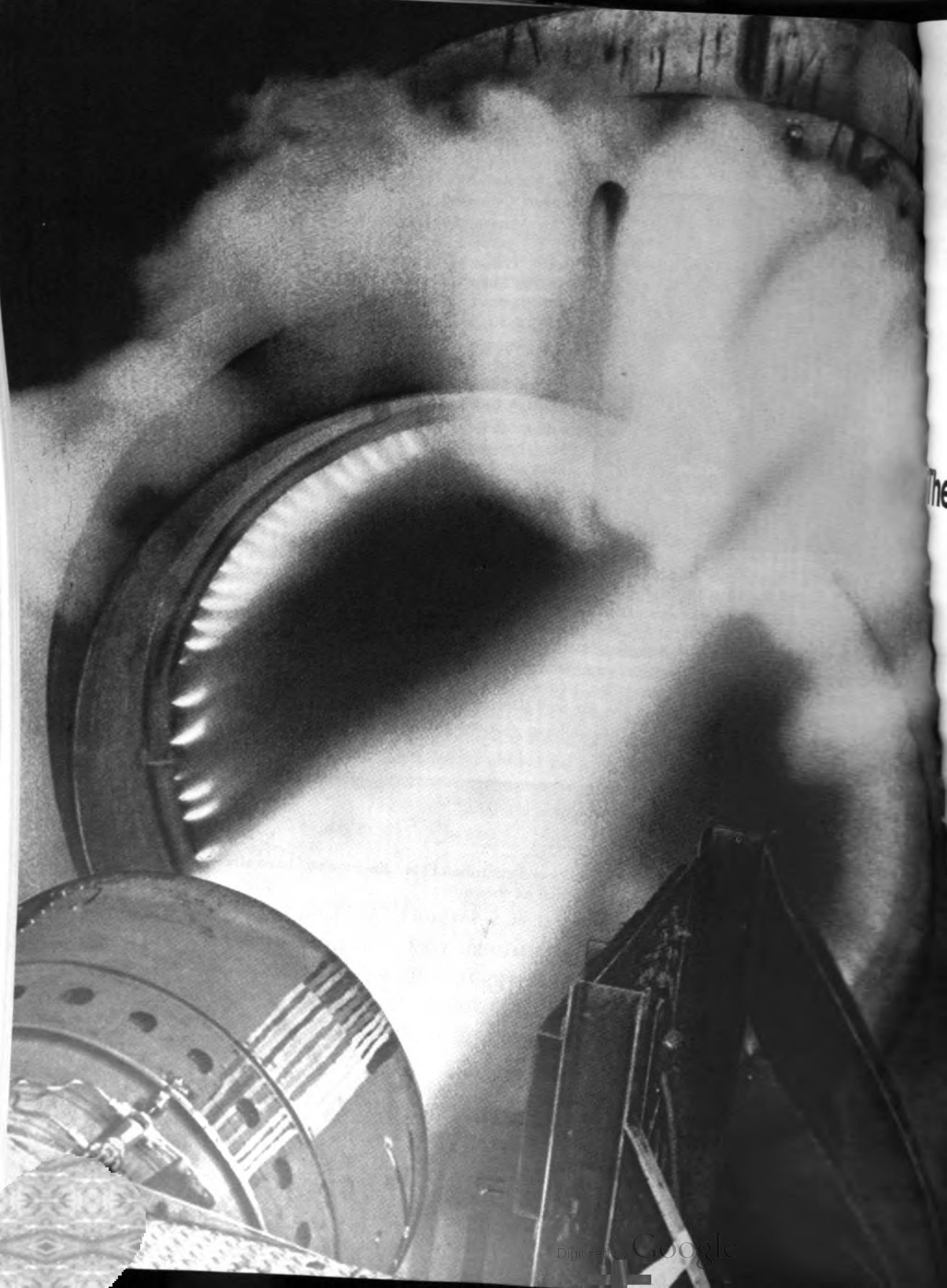
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Balance of Power

By J. R. Hickmott

CHINA is involved in a vast programme of military expansion. Its extent is not known but it is unlikely that the blanket of secrecy is designed to hide its poverty.

Actual figures from the national budget mean little. In fact they indicate an annual expenditure on armaments of about £1,000 million. Even allowing for the different standards of industrialisation a comparison with Great Britain makes nonsense of this minute figure.

	Population	*Expenditure per head*
Great Britain	55 million	£36
China	700 million	£1.4

Adjusted figures for Russian expenditure on armaments to give a true comparison with British standards indicate about £14,000 p.a.

Allowing for items of hidden expenditure and the difference in wages a more realistic figure for Chinese military expenditure would be about £10,000 millions p.a. This represents only £14 per head of population as against the Russian figure of £60.

The U.S.A. has an annual expenditure of about £21,000 millions on armaments. This has to be compared with the approximate figure of £24,000 millions spent by the two major Communist countries. In other words, in the event of a full scale war the U.S.A. would probably be able to contain the efforts of both China and Russia.

But what of the other Communist countries? Each one has military production capacity.

The balance of power would depend, therefore, on the remaining Western countries having sufficient military production capacity to offset that of the Communist satellite countries.

This exposes the fallacy of any country allowing its armament requirements to be dependent upon supplies from even the most friendly neighbours. Apart from the difficulty of determining who would be a reliable supplier in the event of war the principle is economically unsound. In fact it is a gamble with the longest possible odds.

For example, it means in the case of the Royal Air Force that it will get planes so long as there is no major conflict. It means also that if the U.S.A. is involved in a major confrontation with Russia and China, Britain will be without the manufacturing capacity to support air defence or warfare against even minor enemies. Thus, the Government is gambling against a major conflict; a responsibility which is likely to be put to the test within the next three years unless there is a radical change in policy. The Government is saying, in effect, we can save money by buying planes outside Britain and this will be a successful policy providing there is no major conflict.

The expenditure of vast sums of money which will not produce the planes when they are most needed can hardly be called economy.

Suppose a major conflict arises between the Communists and the U.S.A.? It

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would almost certainly be limited to the Far East with India as the main Communist goal. The Pacific ocean would be the equivalent of the Atlantic ocean of the last war and the U.S. Navy would be fully occupied (as was Britain) in safeguarding its shipping across a wide expanse of hostile water.

The Communists would certainly make diversionary moves in the Middle East, particularly against British bases in the Persian Gulf. France might remain neutral thus placing a barrier between us and this area. Gibraltar could only handle an insignificant part of the air traffic.

How long would the bases in the Persian Gulf remain operational? A few days, perhaps a week?

The Suez Canal is blocked now and this would be the position in the event of a major war. The surrounding areas would be hostile and overflight to the Gulf either forbidden or impossible without fighter cover. Similarly, without fighter cover the Mediterranean would be a useless route for either merchant shipping or naval forces.

The next three years will be the most critical in world history. Neither appeasement nor British withdrawal is the way to avoid another tragedy. There must be powerful evidence that Communist aggression will mean a hard, long fight.

Firstly, the British aircraft industry must be given the go-ahead for producing an adequate range of military aircraft at home. Lack of this ability will be one of the major factors in determining Communist strategy.

Secondly, the Navy must have additional aircraft carriers for use in the Indian ocean. Two should be laid down each year for the next three years, together with associated vessels. In addition we must have at least another 500 submarine chasers and other similar vessels for use off the coast of Africa.

Thirdly, there must be an immediate settlement of the Rhodesian problem and the re-commencement of the supply of military equipment to South Africa.

Fourthly, powerful efforts must be made to prevent the build up of Communist forces on the African continent.

Fifthly, we must reach agreement on the combined use of Portuguese East Africa in the event of war.

Sixthly, supplies of military equipment and air bases must be built up in Australia.

Seventhly, Singapore must be reinforced.

Eighthly, significance must be attached to the build up of French forces in the Chad territory and its relationship to French Somaliland.

The Cost? Obviously astronomical sums of money. But the choice is simply this: don't spend the money and there will almost certainly be a Third World War. Spend the money and there is a reasonable chance that war may be averted.

A properly planned economy can well sustain this expenditure even if we have to do without the luxury of half a million unemployed and millions spent in redundancy payments.

After all, any fool can save money by not buying the essentials of life. But how long will he live?

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50 YEARS OF THE SOVIET ARMED FORCES

By Wing Commander J. F. L. Long, M.A., R.A.F.(Retd.)

At the time of writing, almost on the eve of the 50th anniversary celebrations of the Russian Revolution, press comment in the West is perceptibly leaning towards the view that Soviet military strategy is on the point of undergoing (as the Marxist would say) a dramatic qualitative change. To some extent this has been given direction by Mr. McNamara's recent shift of position on the question of ABM deployment, but the trend was apparent even before the U.S. Defence Secretary spoke. In a nutshell, the idea is abroad, "confirmed" by several alarming estimates, that the U.S.S.R. is contemplating not only the deployment of a "thick" ABM system but also a swift increase in its ICBM strength. It has also been suggested, possibly on the basis of a vague remark thrown out by Marshal Krylov, that to this increase in offensive nuclear power, the U.S.S.R. will soon be adding a multiple warhead (MIRV) capability. It is obviously not easy for anyone working outside the closed-off area of classified information to appraise the validity of some of the figures now being produced, still less the appreciations based upon them, but if impressions count at all, it would seem that we stand in great danger of being overkilled by statistics to a point where we can no longer see current Soviet strategic and military trends in their proper historical perspective.

It is, therefore, with considerable relief that one turns to Malcolm Mackintosh's latest book, *Juggernaut*, a compact and sober picture of the growth of the Soviet armed forces since their foundation [1]. Well known to British and American readers as author and lecturer on Soviet political and military strategy, Mr. Mackintosh now provides a splendid antidote to current exaggerations. Conservative in his estimates of Soviet military capability, the author scrupulously avoids arguments based on dubious analogies and extrapolations. But his is a conservatism matched with an unrivalled authority which springs from an intimate and continuous study of Soviet military developments since the moment, in the Second World War, when he found himself working with the Soviet forces as well as from his apparently unique opportunities since then to view these developments not from the standpoint of a card indexer of excerpts from the Soviet military press or from the confines of the campus, but from the privileged and unusual position of a military man turned analyst.

The sub-title of Mr. Mackintosh's book suggests that the period covered is from 1918 to 1966, but there is some evidence to suggest that the text was updated to take account of Marshal Malinovsky's death in April, 1967. The new army of the Revolution, Mr. Mackintosh points out, was founded not on February 23, 1918, as custom claims, but on January 28 of that year when Lenin signed the decree that finally brought the Red Army into existence. The Red Navy was born two weeks later on February 14. At this period the new regime faced many enemies and,

(1. *Juggernaut*, by Malcolm Mackintosh. The Macmillan Company, New York, 1967), $6.95.

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however desirable it might have been to raise a territorial force composed of workers and peasants (as communist theory required), the situation was too critical. The new army had to be built up on the ruins of the old and use was made of any organization which came to hand and which could be controlled politically. As a result, the army's brilliant architect, Leon Trotsky, was faced with two main problems, the first of which was the loyalty of the professional soldiers drafted back into the army as "military specialists" and the second was the reluctance of the peasant masses to return to the colours. The first problem Trotsky attempted to solve by instituting a system of political commissars, with wide powers of control over the military specialists and the second by the introduction of communist cells into the army to stiffen morale and spy out disaffection. These communists, as it turned out, despite the heavy casualties they suffered in the fighting, "proved to be a vital factor in the build up of the Red Army and in its final victory over internal and external enemies four years later." Mr. Mackintosh calls it an "extraordinary force" and does not play down its achievements which were, he says, against "more experienced regular troops, both Russian and Allied."

But already the shadow of Stalin was beginning to eclipse the outstanding figure of Trotsky. Mr. Mackintosh is careful to note the occasions on which Stalin, in his role as political commissar at the front, shamelessly encouraged men like Voroshilov, Budenny and Yegorov to disobey the orders of the supreme commander. It comes as no surprise to have confirmed authoritatively one's scattered impressions of Trotsky as the man who was right in the main crises of the civil war. Unprofitable though the historical "if" game generally is, it is impossible not to speculate on how vastly different the development of the Red Army might have been had Trotsky been left to guide it through the whole of its formative period.

Another of the big "ifs," about which military historians both inside and outside the U.S.S.R. still argue vehemently, centres on the effects of the Red Army and Navy purge of 1937-38. Between 1925 (when Trotsky was dismissed for curtailing political influence in the armed forces and for their alleged unpreparedness) and 1937 (when, almost overnight, Marshal Tukhachevsky and seven other leading army commanders were sentenced to death by a military tribunal and shot on the basis of manufactured NKVD evidence of treasonable relations with the German High Command), the Red Army was reorganised (by Frunze), re-equipped (by Voroshilov) and provided with a doctrine (by Tukhachevsky), as a result of which an essentially guerrilla force was converted into a modern mechanized army. In many respects, Tukhachevsky's view of strategy, as Mr. Mackintosh stresses, "even today is remarkably up to date," with its emphasis on the need to "integrate diplomacy and foreign policy closely with industrial development and military power" and its understanding of the significance of the bomber and mechanized forces. Tukhachevsky was fortunate to be served by "a remarkable group of men" who had "emerged from the civil war as efficient and forward-looking military leaders." But the new mobile shock army which this team created, backed by the world's first parachute troops (introduced in 1931) and a long-range bomber force (established in 1936), wanted a long period of intensive training in which to develop its potential. This it was

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not given. Denuded by executions, imprisonment, exile or retirement of possibly as many as 35,000 officers, the Red Army that remained after the bloodbath was riddled with insecurity and commanded by men of limited qualifications, who lacked an "understanding of the trends of modern warfare." Had Tukhachevsky and his colleagues remained alive, would the incompetence of 1940 and the disasters of 1941 have been avoided? Mr. Mackintosh asks the question and gives a severely qualified answer. He stresses that while the High Command in 1936 "included men of the highest abilities and originality," it was "certainly not the brilliant galaxy of military genius some critics of Stalin's subsequent purge have made out." Tukhachevsky and his colleagues would still have had to work under Stalin "with all his cruelty, suspicion and ignorance, and deal with the well-nigh impossible demands which his tortuous plotting in foreign and defence policy placed on the armed forces." Mr. Mackintosh, having surveyed the evidence afresh, concludes that it is not possible automatically to believe that they would have avoided the errors of the Finnish campaign and defeated the German invasion at the U.S.S.R.'s frontier.

It is one of the special merits of *Juggernaut* that Mr. Mackintosh does not avoid passing historical judgements. Many are of major proportions (such as his estimate of the baneful influence of Stalin's military thinking upon the armed forces after the Second World War) but some are simply parenthetical comments, carefully offered, nevertheless, in the interests of historical perspective (such as his masterly summary of the battle of Khalkin Gol in 1939 or his reassessment of Timoshenko's efforts after the Finnish war of 1940 to reorganize the Red Army). Some readers may, perhaps, miss in the crystal-clear analysis of the massive battles of the Second World War a majestic and memorable sweep of language that fixes permanently in the mind their truly heroic proportions (only rarely, within the strict limits imposed upon him, is Mr. Mackintosh able to let one smell the stench of battle and admire the heroism). But other readers will feel that, whatever is lost in this way, is more than compensated by the strict balance of the narrative, the relentless quality of its forward movement and the care with which the highest level of historical accuracy is assured.

Notably welcome are the balance and factual accuracy of the later chapters, where Mr. Mackintosh describes the more significant changes that have taken place in the Soviet armed forces since Stalin's death in 1953. Stalin's influence in military affairs after 1945 is seen as being almost entirely bad. Totally unaware of the revolution that modern technology was bringing about, Stalin clung to a military doctrine which he had propounded in 1942 and which he believed would not only provide the pattern for a third world war between capitalist and communist blocs but would be "valid for all time." Mr. Mackintosh makes it clear that the Soviet military leaders were unable to protest effectively, paralyzed as they were by the fear of Stalin and the NKVD. Little wonder that the late Marshal Biryuzov dismissed with scorn the futile discussions of military questions that took place in the specialized journals at this time. What else was possible when the Generalissimo believed that the atomic bomb was not a "serious force" and could not "decide the outcome of a war," or that surprise was merely a temporary factor, or that the West was doomed

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to defeat in any war with the U.S.S.R.? No imaginative thinking about the implications of modern weapons of mass destruction was possible. This resulted, as Mr. Mackintosh points out, "in the upkeep of a vast army, air force and navy at a prohibitive cost and the virtual starvation of the civilian elements of the economy, especially in agriculture." Yet, in the last years of Stalin's life, a "distinct movement" away from some of the leader's more "unrealistic concepts" occurred with the appointment of Zhukov to active duty with the High Command and the appointment of Sokolovsky as Chief of the Soviet General Staff and Nedelin (the long-range rocket specialist) as a deputy minister of defence.

However, the head of steam which had been building up in the military establishment about questions of military doctrine and strategy found no effective means of escape until after Stalin's death. The first indication that a wide-ranging debate was in progress among the service chiefs on the shape of a new military doctrine came in September, 1953; but it was not until Khrushchev and Bulganin assumed power in February, 1955, that the shape actually became apparent.

> "This doctrine (Mr. Mackintosh writes) was based first on the premise that all-out global war might explode, and if it did the Soviet Union must expect to receive a very heavy nuclear attack by the United States's Strategic Air Command against targets all over Soviet territory. Therefore, to survive this blow, air defence must be given much greater priority and resources for research and development. Second, the role of the ground, sea and tactical air forces was to strike out in all possible directions from their peacetime stations and engage the enemy's forces wherever they could find them. The aim of this formulation was two-fold: to get in close contact with the enemy in circumstances in which the Soviet forces would have the initiative, since the enemy would find it difficult to use nuclear weapons when both armies would be locked in battle; and to move as rapidly as possible away from regions heavily contaminated by nuclear explosions so that, whatever happened to the homeland in the short run, the armed forces would continue to exist as a homogeneous body. All other forces would be dispersed as widely as possible into less-populated areas of the country and would help the civil authorities in rescue and rehabilitation work."

The man to translate this new doctrine into life was already at hand — Marshal *Zhukov*.

The brief period of this remarkable soldier's control over the Soviet defence ministry was notable for the reorganizations which took place both of Soviet air defence and of the structure and deployment of the ground forces, which led to a manpower cut of 1,840,000 men. He may have begun to believe, as Mr. Mackintosh suggests, that he was indispensible to Khrushchev. Certainly, even before his elevation to full membership of the ruling party presidium as a reward for supporting Khrushchev against the so-called anti-party group, tension between the marshal and Khrushchev was evident. However, it was his attempts to reduce party control over the forces, culminating in a series of orders curtailing political indoctrination classes in favour of military training, which caused Khrushchev to sack him unceremoniously but finally. Thereafter, Soviet military doctrine and policy became increasingly associated with the name and personality of Khrushchev, who believed, erroneously as it proved, in the feasibility of an inexpensive all-purposes strategy based upon a largely static rocket force.

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In January, 1960, at a session of the U.S.S.R. Supreme Soviet, in the course of a major defence review, Khrushchev announced his own simplistic extension of the doctrine of 1955.

In essence, Khrushchev argued that the initial period of a third world conflict would involve an exchange of long-range nuclear blows between the West and the U.S.S.R. which would, in all probability, prove decisive. Thus, he said, much smaller conventional forces would be required to bring a war of this sort to a successful conclusion. At the back of his mind, Khrushchev saw the bomber aircraft joining Engels's axe in the museum of antiquities. He derided the view that victory would be the result of joint action by all branches of the armed forces, over-rated the efficacy of ABM's and even resurrected the post-revolution idea of a territorial system for part of the ground forces. Any refinement of the doctrine of massive retaliation into one of flexible response left him cold and, although it would be an over-simplification to say that Khrushchev never really responded to the lessons of the Cuban missile fiasco or the advice of his marshals, he left office in October, 1964, unaware that his main assumptions about military strategy had already been eroded, as the decision to develop forces for operations in secondary theatres in a non-nuclear role in that year showed. Among the most interesting sections of Mr. Mackintosh's survey is his description of the state of the Soviet armed forces today, in which he suggests not only that there has been a renewed emphasis on professionalism in defence planning since Khrushchev's removal but also that there does appear to exist a constructive relationship nowadays between the political and the military leaders. He sees signs that Soviet naval doctrine, which traditionally has been a defensive one, now has acquired an offensive cutting edge as it responds to the threat of the U.S. nuclear strike carrier force and develops an increasing long-range capability. He dissents from the view of the "broken wing" school of military pundits that the Soviet doctrine of air power has discarded the long-range military aircraft (if one reads aright his tentative forecast of the existence of a replacement for the M.4 jet missile-carriers by a supersonic delta-winged bomber) and he evidently does not believe that the Soviet ABM system can achieve in the next decade a sufficient degree of invulnerability to enable the U.S.S.R. to "reconsider the option of a preventive war against the West." He is silent on the question of multiple warheads for Soviet ICBM's. Looking ahead some years, he suggests that the U.S.S.R. may acquire a capability, now enjoyed by the U.S. and Great Britain, to intervene effectively with non-nuclear forces in distant areas of the globe. On the whole, however, Mr. Mackintosh is not pessimistic about the more distant future. Whatever the direction of Soviet military effort may be, he writes, the "most hopeful element will probably be the basically Russian character of the Soviet forces." Although the Russian people had throughout their history been involved in almost continuous warfare and struggle, they were not by nature a militaristic people who gloried in war and conquest. Thus, he concludes, if the peoples of Russia had the final say in Soviet policy, "a new war, fought with the horrors of nuclear destruction, would not be their way of achieving their national aims any more than it would be the way of the people of the United States or the Western world."

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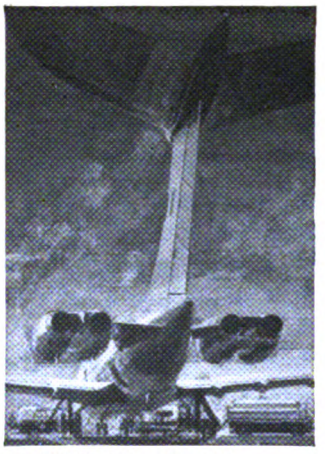

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LEADERSHIP WITH SPECIAL REFERENCE TO WORLD WAR II

By Air Vice-Marshal E. J. Kingston-McCloughry,
C.B., C.B.E., D.S.O., D.F.C., M.A. (Cantab.), R.A.F. (Ret.).

The Author has just completed his narrative of World War II. He was engaged before, during and after the Second World War upon planning War Organisation, in 1939 in the Office of the Director of War Organisation, as Head Air Operational Planner for "OVERLORD" and post-war was Chief Air Defence Officer at the Ministry of Defence.

In consequence he was frequently in the closest contact with the Architects of our Defence Plans and Supreme Commanders in our final victorious assault on the Germans.

He has very kindly granted "The Royal Air Forces Quarterly" the privilege of publishing a series of extracts from his new book. Many of our readers will have read his earlier books "Winged Warfare"; "War in Three Dimensions"; "The Direction of War"; "Global Strategy"; "Defence Policy"; "National Strategy"; "Defence" and "The Spectrum of Strategy".

For our series of extracts we have selected the last Chapter of his latest book, as being of special interest to our Service readers.

[The first of this series I to V was published in the Autumn, 1967, number of this Journal]

VI

THE VISCOUNT MONTGOMERY OF ALAMEIN

During Overlord in the planning, assault and post-invasion stages I had an unusual opportunity of seeing what inter-service co-operation really meant: here the familiar problems were magnified a hundredfold. In particular, at this time I knew Field-Marshal Montgomery and his senior officers who most influenced him throughout Normandy. As Leigh-Mallory's liaison officer at Monty's H.Q. before the break-out in Normandy I enjoyed a valuable opportunity of watching the Field Marshal at work.

Field Marshal Montgomery went through the two World Wars and had the appointments that usually indicate the future General: regimental duties, an instructorship at the Staff College, command of a Division in action in France in 1940 and later command of a Corps, and then the U.K. South Eastern Command. He differed from most others during this period in the time he gave to physical fitness and the study of war. After the death of his wife in 1937, he studied war, in particular tactics, to the exclusion of all other things. All this was known to his contemporaries, but what was not realized

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was that during this time he was also learning how to lead men. It would be interesting to know how much this was a natural gift and what books and methods he studied. Certainly Field Marshal Montgomery had prepared himself to take full advantage of any appointment in military command which came his way.

Physically Field Marshal Montgomery is a slender, hard, hawk-like, energetic man, with piercing blue eyes, long nose, sparse sandy hair, hardly of average height, incisive, ruthless, evangelical and dynamic. Militarily his habits were unusual and before he became famous many found them disturbing. He neither drank nor liked ladies' company. He did not smoke, and found it difficult to tolerate smoking in his presence. He quoted scripture and prayed regularly and did not fear to do it openly. He detested unnecessary noise and coughing or rustling in conference and at lectures, and above all he demanded utmost punctiliousness from his officers and men. He conducted violent whirlwind inspection trips to his troops and had an unmilitary practice of presenting them with gifts of cigarettes. Moreover, Field Marshal Montgomery had an innate sense of the dramatic and certainly knew how to bring himself to the notice of the troops and the public.

It was accident that gave Field Marshal Montgomery his chance—the tragic death of General Gott, who had actually been nominated C-in-C 8th Army and was reputedly the best desert fighter in the British Army, killed a little before El Alamein. This disturbed the careful plans of the High Command and led to Field Marshal Montgomery, almost unknown to the general public though not to the Army, and with no desert experience, being appointed to command the Eighth Army.

He was fortunate in taking over command of the Eighth Army just at a time when it was at last getting an ample scale of new equipment which previous Generals had lacked. There were substantial reinforcements, and in particular new British tanks, and the whole Army was supported by an Air Force which had gained ascendancy over the German and Italian air forces. In the anxious days ahead of him, moreover, Montgomery was to enjoy an intelligence service far superior to any that had gone before. However, he went to Egypt on a difficult and tough task and one which would have made most skilled commanders anxious. The military situation was serious because Rommel was at the gates of Egypt, and the Army was much disheartened and had lost the confidence that only a victory could restore. While Egypt herself was nervous, defeatist, and ready to receive Rommel or Mussolini, Montgomery was faced with the task of snatching victory for his heterogeneous and mixed Army.

His first order to his troops read: 'We will fight the enemy where we now stand; there will be no withdrawal and no surrender.' He also ordered all plans for retreat to be burnt. The new Commander was something the Middle East had not before experienced, and the effect was electric. From that moment on the Eighth Army never looked back. There is no question whatever that Field Marshal Montgomery's personality and methods swept through his Army like a flame and really did revolutionize the morale and confidence and the pace at which preparations and all other things were done. It was sheer leadership, character, courage, self-confidence,

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showmanship and 'drama', which reacted on an Army most ready to accept any inspiration: having spent so many months in retreat, the order to stand fast came to them like a breath of fresh air. Field Marshal Montgomery was fortunate in arriving at a psychological moment when he could use his personality and talents to the full, and in having the tools and weapons to win victory.

Having achieved this initial success, he developed it by such methods as painting 'Monty' on his personal reconnaissance tank, wearing most unorthodox clothing, and everywhere he spoke to the troops and officers and made them all partners in his project—to defeat Rommel. In this projection of his personality on his Army he was deliberately fostering that hopeful element in each of us that we are Fortune's favourites and are in luck's way: he rapidly came to symbolize first the hope and then the conviction of victory: he was not only the General of the Army, but also their mascot. Besides all this a vital element in the revival of his Army was the awareness that tanks, aircraft and equipment hitherto lacking were at last in plentiful supply, which must have gone a long way to restoring the Army's confidence. While this circumstance in no way diminishes Monty's achievement, resources for the Army, the R.A.F. and the Navy became available too late to save the reputations of other Commanders. Had there been sufficient Centurions and aircraft available prior to Alamein the history of the war in North Africa would have been quite different. As it was the Cs-in-C. Coningham, the Auk and Tedder had already decided before Monty's arrival that the stand would be made at Alamein.

In a few weeks Field Marshal Montgomery had made a lasting impression on every man in the Eighth Army. The Army were familiar with regimental esprit de corps, but he had inculcated Army esprit de corps. Under the warming influence of success, Field Marshal Montgomery expanded visibly and became more and more unorthodox and also made closer touch with newsmen. The exploitation of publicity which Montgomery had begun as part of his deliberate plan to inspire the Army resulted in Montgomery himself enjoying the limelight he created for himself and the Army. From that time on Alexander, the C-in-C of all Middle East land forces, gave Field Marshal Montgomery all his support though on occasion compelled to advise sharply. As for commanders and staff, Monty was ruthless: no personal consideration was allowed to stand in the way of efficiency.

Although Monty always tried to convey the impression that when he arrived at 8th Army H.Q. he made a clean sweep of everyone he found there, he in fact retained the nucleus of a first rate Staff. General de Guingand was his Chief of Staff and he proved to be the key man in Monty's train. Monty also drew on officers already serving in the H.Q. and he appointed General Belchem as Brigadier Operations and Brigadier Williams, a former Oxford Don, as Head of Intelligence while General Robertson was in charge of Administration. With this staff he developed a technique of his own in command procedure. There was little paper and there were few written orders so that information, orders and instructions were almost always verbal. Later in France, I saw Field Marshal Montgomery's method of co-ordinating in operation which worked like clockwork, and I can vouch for its superiority over the older and cumbersome method of paper orders and instructions.

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Field Marshal Montgomery made a great study of tactics, but many who know him would not go all the way with popular belief which claims him to be an infallible commander. Everyone, however, would agree that he was a better set-battle tactical commander than a strategist. Many informed authorities would consider Rommel, and Auchinleck also, his superior. He had exceptionally good Intelligence and indeed later he knew at Alam Halfa that the air forces had disorganized Rommel's supply lines and that the Afrika Corps had only three days petrol, one with which to fight and two with which to retire, or three to fight and nothing to retreat. Monty deserves great praise for the morale he inspired in his troops and their battle readiness, but even with the intelligence available he failed to exploit the victory of Alam Halfa, which was indeed the turning point of the war, until Air Chief Marshal Tedder journeyed from Cairo to persuade and urge him not to waste valuable time on reorganizing.

On Christmas Day, 1943, it was announced that the then General Montgomery would command the British Army under General Eisenhower for 'Overlord', the invasion of France. By this time Montgomery had a legendary reputation for never having lost a battle and no appointment could have been more popular with the British people. At Marakesh, when the Prime Minister showed Field Marshal Montgomery the 'Overlord' plan, he at once said that the assault front must be widened and the first wave strengthened. Actually General F. Morgan, the Chief of Staff, Supreme Allied Command (designate), under whom the plan had been prepared, agreed with this entirely, but the limitations put on the assault craft had hitherto been the deciding factor. With the aid of Field Marshal Montgomery, however, he was able to persuade the two political heads to agree to make the necessary increase in troops and the allocation of assault craft.

Soon after Monty took up his new appointment he arranged for a special train to be placed at his disposal, which he used as office and quarters, and he spent much of his time visiting the units of his Army and addressing officers and men. Indeed, he concentrated on raising the morale of his troops and breathing his fire into them as he had done in North Africa. Field Marshal Montgomery appeared almost to neglect the important plans which were being prepared for the invasion and more than once the Supreme Commander complained of his absence from important meetings. Monty knew what he was about; he had complete confidence in his Chief of Staff, gave him his general ideas, and then supported him completely.

Thus Montgomery had all the build-up and panoply of a great commander and it would be churlish to suggest that his success and public acclaim were entirely undeserved. American, and indeed some British, military leaders might not consider him an unqualified success but in the Second World War he undoubtedly filled a place in the public imagination.

It may simply be the turning of the wheel that has dimmed his reputation since the end of the war. Yet during his term as C.I.G.S. at the War Office he made no permanent mark on the British Army and was a relative light weight at the Council table of the Chiefs of Staff Committee.

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He was ever ambitious and at one meeting when the Chiefs of Staff were considering the proposal for the formation of Nato and Shape round about 1950, Monty went to great length describing the qualities and character required for the Supreme Commander. His outline clearly described himself. The First Sea Lord had a sense of humour, and having listened intently to Monty, at once said the navy have just the man the Field Marshal has in mind—Admiral Mountbatten. This statement closed the discussion.

After being C.I.G.S., Monty joined Shape as Deputy Supreme Commander but he made little impression during the term of his appointment. Subsequently, Monty has not had a good word to say for Shape and, in terms of the current political leaders and situations of the Western countries, his comments have by and large been anything but constructive.

Since the end of his active employment, in Government and military circles and with much of the public, Monty's reputation has been falling steadily. Indeed, in 1963 he appeared to become somewhat of a jester in the eyes of many people. At first he attempted to be an unofficial ambassador travelling to the Communist countries, particularly Russia and China and other countries which were not altogether seeing eye to eye with the United Kingdom, such as India and South Africa. But Monty was so eager for headlines and publicity for himself, and with the Press ready to profit, that he became a great embarrassment to the Government, to Whitehall, as well as to many of our Allies.

Monty could not even forego claiming credit for his advocacy of eliminating inter-Service rivalries when speaking in the House of Lords on the 1963 White Paper but in service he was usually the outstanding rival. He went on to stress the need of the three Services pulling together as one team yet Montgomery emphasised in a lecture he gave in the Royal United Institution that he could see no role or place for the Royal Navy in the future. Moreover, throughout the last war and subsequently Monty has spoken much about the need of co-operation of the three Services but, as all who worked with him know, to Monty this meant that the navy and particularly the R.A.F. should subordinate themselves to the role of the army whose importance was dominant.

If we attempt to summarize Field Marshal Montgomery's gifts of leadership, they would perhaps in the main be his facility for not allowing small or even big things to worry him; also his gift of simplifying problems and cutting away all frills; his mastery of military art, his power of clear and arresting expression both written and in speech; his magnificence as a showman and in publicity; and the supreme confidence which he radiates. On the other side of the coin is his conceit, aloofness and self-satisfaction; his intolerance of opinion counter to his own; his indiscreet outspokenness; and his reluctance to participate when he cannot be dictator. That Montgomery only attacked when he believed he had the measure of the enemy and was certain of success might have been an image he was concerned to convey to his troops. A confidence of this kind must have served to make their morale unshakeable.

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VII

EARL ALEXANDER OF TUNIS

Somewhere about the year 1930, I attended a Higher Commander's Course at Old Sarum where I met Field Marshal Alexander, then a Colonel, who happened to be in the same Syndicate as myself. Later, after the war, Lord Alexander was Minister of Defence when I was serving in the Ministry as Chief Air Defence Officer.

It is interesting to contrast Field Marshal Montgomery with Earl Alexander of Tunis. Like so many notable leaders who have served the British Army, they are both Irishmen. Earl Alexander served in the Guards in regimental duties at home and in France for the greater part of the First World War. Debonair, calm in triumph and disaster, he showed outstanding courage, was wounded several times, and was awarded more honours than most junior officers. He was a typical Guards officer and well above the average in leadership, especially with Allied forces. He had a big outlook, was loyal to superior and junior, likeable, a good strategist and a good leader. In co-operation with other commanders, with the other Services and other nationals, he was outstanding, and certainly he was one of the British leaders most liked and admired by the Dominions and America. He was, indeed, one of the Army's most favoured sons.

Earl Alexander was fortunate in getting early valuable operational experience as a brigade commander on the North West Frontier of India. He quickly adapted himself to this type of warfare and this, together with his outstanding courage, resulted in successful operations which earned him much credit. At the outbreak of the Second World War he commanded the 1st Division which was one of the first to go to France, where he was an inspiration to his tired troops after the collapse of the French Army; and he was Lord Gort's choice to take over the I Corps and conduct the final stage of the evacuation at Dunkirk. It was typical of him that he was the last man off the beach. Earl Alexander got further valuable experience as a fighting General in his command of the Burma operations in 1942, though there he did not achieve any notable successes, but this is not surprising because it was a hopeless campaign.

From Burma, Earl Alexander went to Egypt as C.-in-C. Middle East land forces. Probably it was his Dunkirk reputation which was the final influencing factor with the Prime Minister in this appointment. Although Field Marshal Montgomery was slightly senior to Earl Alexander, as Eighth Army Commander he was under Earl Alexander. Fortunately, Earl Alexander was the type who did not interfere unduly

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with his subordinates, and at the time of El Alamein it can be taken that he interfered as little as possible. He kept Field Marshal Montgomery provided and allowed him to take the whole credit for the successful campaigns which ensued. He had a wry regard for him. It was fortunate that the two appointments were not reversed, for neither Earl Alexander nor anyone else could have commanded the Eighth Army at El Alamein without great interference had Monty been C.-in-C. Middle East. Indeed, the reversed position would probably have been intolerable. Moreover, informed opinion would probably agree that tactically, for nimbleness of mind, for drive, for command of set tactical battle, Field Marshal Montgomery was superior to Earl Alexander. On the other hand, Montgomery would have been Alexander's inferior as C.-in-C. Middle East land forces, a post which involved many and varied problems including responsibility for operations in other countries in the Middle East, which were fluctuating continually and called for the greatest tact, co-operation and accessibility.

In Tunisia Earl Alexander was fortunate in working with the Americans and becoming known to them. He took over the post of Deputy to General Eisenhower, with the special task of co-ordinating the operations of Field Marshal Montgomery with those of the Allied land forces in Tunisia. As would be expected, he went down well with the Americans and was a great success, not only as a man, but as an operational C.-in-C. He won not only the admiration and trust of the officers and men of the American Armies but also of the French as well as the British.

(The views expressed in this Journal are those of the Authors and are not to be construed as official opinions or policies—EDITOR)

DELIVERY OF ARTICLES TO EDITOR

The *final dates* upon which articles must reach the Editor for inclusion in the Spring, Summer, Autumn and Winter numbers are: —

SPRING (MARCH)	22nd DECEMBER
SUMMER (JUNE)	25th MARCH
AUTUMN (SEPTEMBER)	24th JUNE
WINTER (DECEMBER)	23rd SEPTEMBER

It is sincerely hoped that contributors will not wait until the very last day before dispatching their articles to the Editor, as this can seriously disorganize the works schedule for getting the "Quarterly" to press and could delay its date of issue.

The early delivery of copy would be greatly appreciated.

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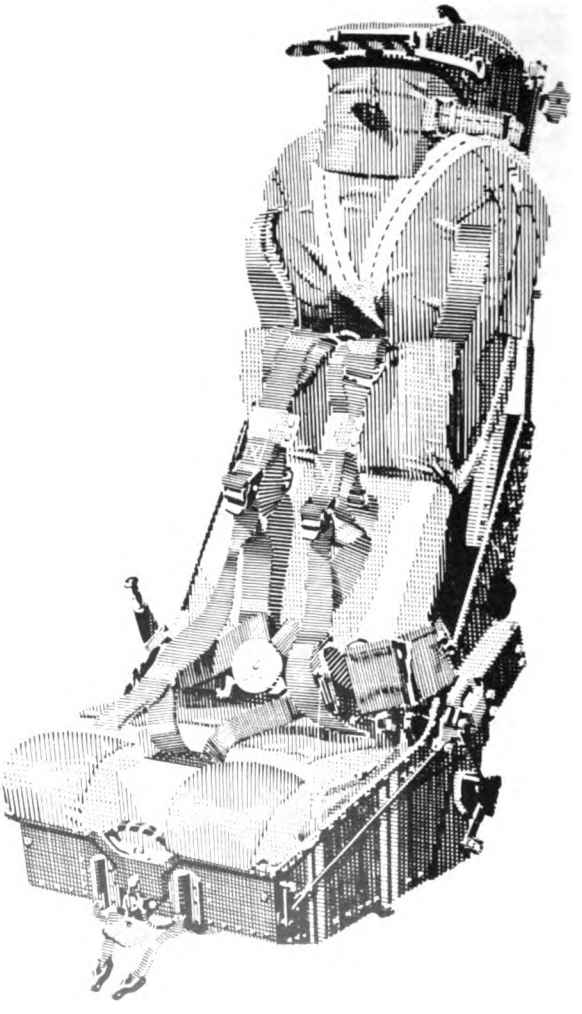

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Vietnam– The need of Government

By Dr. C. L. Wayper, M.A., Ph.D.

FOR centuries Vietnam has been a violent and divided land, its people hardened by history and conditioned to fighting and every kind of rapine. And this in itself is a reason for doubting whether compromise is yet in sight there: a softer folk might before now have found the strain unbearable but these people lack neither the ability nor the will to endure.

There are other reasons too. Hanoi's determination to inflict humiliating defeat on the U.S.A. has not yet been shattered. The desire, the necessity and the opportunity that prompted it in the late 1950's to call upon its supporters in the south are as strong today as ever they were. No foreign observer in the north has seen any sign of a break in the fierce desire of nationalism to unite the two parts of the country. The necessity of acquiring the southern ricebowl is as great as it ever was. There is still the belief, despite the vigour of American resistance, that the opportunity to do this is there to be seized, a belief that cannot be expected to wane as long as the U.S.S.R. is increasing its military aid and the U.S.A. not yet demonstrating a convincing capacity to deal with the Vietcong. Powerless to kick American forces out of the country Hanoi is still of the view that they can be levered out by the pressure of world opinion, by the pressure of American opinion or even by the pressure of S. Vietnamese opinion. Only if proved wrong in this expectation will its leaders think again.

But if Hanoi is not likely to think again, neither is Washington. No doubt it wishes that it had asked itself the question "Should we go into Vietnam when the price of doing so may be high?" Because it did not it was compelled to answer a much more difficult question, namely "Now that we are in should we allow ourselves to be kicked out or should we reconcile ourselves to the doing of those things that alone will prevent it?" But however much it may regret the mistakes of yesterday it has to live with the situation today. And it knows that the issue before it is not now whether or not it might be possible to live with a communist Vietnam, to which question perhaps an increasing number of Americans would be inclined to say yes, but whether or not humiliating defeat, which is all that Hanoi offers them, would be compatible with their continued presence and continued interest in S.E. Asia, to which question the majority of Americans, understandably enough, are still saying a determined no.

In this situation they will pay no more attention to the views of other states which feel it iniquitous of America not to pull out of Vietnam than they did during the

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Cuban crisis. Perforce they will pay more attention to the views of their own people, as others do too. But no significant body of American opinion has as yet reconciled itself to the humiliating defeat and all its consequences without accepting which America cannot as yet find the way out of Vietnam. Moreover although Washington has not succeeded as well as it had hoped in promoting S. Vietnamese determination to crush the Vietcong it has contrived better than it had feared to prevent the situation developing in which S. Vietnamese public opinion would have insistantly demanded, even at the price of accepting Hanoi's terms, the ending of the fighting.

For the moment, then, we are dealing with the unshakable resolve of Hanoi to inflict maximum humiliation on the Americans and with the unshakable resolve of the Americans to avoid it. Whence is drawn the odd conclusion that only a political solution of these troubles in Vietnam is possible, when everything tells us that it is not. For when unshaken wills are in conflict politics, which is the art of compromise as well as the art of the possible, can play no part. Either the resolve of Hanoi or that of Washington must be broken. When that happens politics can once again take over; until it happens war, with whatever weapons it is fought, must remain the order of the day.

Only one thing, it seems, could change this situation. That is such collapse of government in S. Vietnam as occurred in Aden, for this would leave nothing with which the Americans could work. This is not very likely to happen but it could. For the Americans, whose understanding of the requirements of counter-insurgency has been vitiated by their wealth (they never appreciated the importance of that improvisation which, having to do things on a shoestring, became almost second-nature to the British during the Emergency in Malaya), have also been misled in Vietnam by their ideals. They have rightly understood, as did the British in Malaya, the importance of satisfying popular aspirations. But they have believed that this means the promotion of democratic elections, even of village officials, in circumstances that are far more conducive to the strengthening of instability than of democracy. They have been so taken up with winning the hearts and minds of men that they have paid insufficient attention to protecting their bodies. They have forgotten that while government that is popular is desirable government that is government is essential. They have failed to induce S. Vietnam to develop a structure of rural administration and a rural police force. These were present in Malaya and it was therefore possible to prevent small guerrilla bands, once the soldiers had withdrawn, from executing those who had collaborated with the enemy. It is because they are not present in Vietnam that the Vietcong can govern the village and thus continue to challenge the state.

The state, Aristotle said, which continues in being to fulfil the good life, came into existence to preserve life. In much of S. Vietnam it is still failing to do so and that failure could destroy the American resolve to refuse humiliating defeat there, as it must strengthen Hanoi's resolve to inflict it. Conversely success here could so weaken Hanoi's stand as to give the U.S.A. the chance that has hitherto eluded her of extricating herself from a highly undesirable position in such a way as not to damage too greatly her wholly justifiable pride and her wholly legitimate prospects.

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THE PLACE OF MANAGEMENT IN THE ROYAL AIR FORCE

By Wing Commander D. C. Robinson, R.A.F.
(On Directing Staff, R.A.F. Staff College, Bracknell)

INTRODUCTION

THE term 'management' has been the subject of semantic imprecision both in Industry which coined it, and in the Royal Air Force, where it is beginning to be accepted as an essential element of the supervisory scene. The difficulty is compounded if one attempts to place management in relation to 'command' and 'leadership' since these latter terms are also beset by differing interpretations. Little wonder that grey areas are often created rather than illuminated by such debate. Because significant advance in the general acceptance of management concepts cannot be achieved until there is agreement on terminology, this analysis considers management in the context of command and leadership, suggests a definition of Royal Air Force management, and briefly describes the assistance that management skills can give to the commander and staff officer.

THE PROBLEM

The problem stems from a lack of established management philosophy; indeed there is general mis-understanding of management objectives in the Service environment. To some the term is synonymous with the officer cadre, to others it is an hors d'œuvres of academic studies served up on courses for student consumption, whilst sceptics consider it a misguided attempt to apply industrial gimmickry to military activities. Then there are those to whom management is some vague panacea: who think that a yard of it applied to the affected part will realise a startling improvement in a creaking organization!

One of the originators of scientific management, Frederick Winslow Taylor, in seeking 'the one best way to do work', began to look systematically at human endeavour in the United States in the 1880s. In the last 80 years many of the ideas of the early management pioneers have been developed by numerous other authors, but established terminology has yet to emerge. Small wonder that the Concise Oxford Dictionary can do no better than tell us that management is concerned with trickery and deceitful contrivance!

MANAGEMENT SKILL AS AN ATTRIBUTE

Let us first consider the relationship of management skills in juxtaposition with command and leadership. We can dispose summarily of the fact that the commander equates with the manager in civil life. Both are responsible for translating the policy of the 'Board' into efficient executive action. It is true that the industrialist is concerned with the creation of profit for the shareholders, whilst the commander seeks

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operational 'profit', but these divergent goals are approached along similar routes. On the other hand, the growing practice of referring to the senior staffs of units and formations as 'management', for example in the context "Unit management must ensure that . . . ." is inappropriate, since as we shall now see, the exercise of efficient command requires more than the employment of management skills.

The officer qualities of the commander may be divided into three separate, though inter-connected traits: firstly professional knowledge, secondly management skills, which can otherwise be thought of as administrative skills, and thirdly, personal qualities. Management skills are the connective link between professional knowledge and personal qualities, and by enlarging on this relationship we can establish the role of management.

Professional Knowledge

The professional knowledge of the commander and staff officer is divisible into that general service knowledge embracing the body of doctrine required by all officers in the course of their duties, and that specialist knowledge which is apposite to the branch of the officer concerned. The balance between general service and specialist knowledge alters with elevating rank, but the requisite total of professional knowledge must be acquired and used at every level if command is to be effectively exercised. The possession of comprehensive up-to-date professional knowledge provides the commander with the awareness of options and constraints within which his decisions must lie. The judgement and expertise required to select that option providing greatest efficiency stems from the application of professional knowledge to the administrative skill—that is, management skill—of the commander.

Administrative Skills

Administrative skills are a measure of the knowledge and application of management practice which converts effective performance into efficiency. As such, administrative skills embrace both the structured problem-solving techniques of operational and critical path analysis, budgetary control, value engineering, and also the unstructured complex of human relations considerations of which the commander must continually take account.

Personal Qualities

Like professional knowledge and administrative skills, the personal qualities of the commander can be divided into two parts. Leadership is one, and self motivation is a suitable label for the other. Leadership is an amalgam of the ability to inspire and to win the confidence of others. Largely inherited, though capable of development by study, leadership is founded upon integrity, strength of purpose, a genuine interest in the well-being of ones subordinates and that indefinable something which is presence or personality.

Whilst leadership is outward, in that it governs relationships between the commander and his subordinates, self motivation concerns the man himself in terms of drive, determination, endurance and energy. Just as one can exercise authoritarian command in the absence of leadership, so the combination of leadership with profes-

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sional knowledge and organizing ability may well establish passive command. Without the drive and enthusiasm of the commander, however, the organization fails to become dynamic, and is therefore unable to attain peak efficiency.

THE CONCEPT OF SCIENTIFIC MANAGEMENT

Management Defined

Having disposed to a degree of what management is not, and having shown that it is one of the three qualities of command, we can now consider defining the term. A Service definition considers it as 'the process or series of processes by which operations, administration and maintenance are put into effect to achieve the commanders aim'. This, however, only goes part of the way, for the essential feature of management, the quest for increasingly efficient performance by improved methods, is entirely absent: nor does this definition convey the scope of the interrelated subjects involved.

Scientific management seeks to apply critical objective analysis to existing methods and new problems using the approach of the scientist. Thus, past operations are analysed, hypotheses are elaborated to explain the analysis, and after test the hypothesis is used to make predictions—which are more reliable than intuitive conjecture—about future operations. In this way management submits qualitative judgement to quantitative analysis, thereby reducing the areas of uncertainty on which the commander must base his decisions. F. W. Taylor put it neatly when he wrote "both sides must recognize as essential the substitution of exact scientific investigation and knowledge for the old individual judgement or opinion, either of the workman or the boss".

A Royal Air Force Staff College definition, which takes account of these considerations and therefore merits consideration for universal acceptance, says "management is concerned with optimising the use of resources, both human and material, to achieve the commanders aim, including the application of modern socio-economic and other scientific techniques".

It is emphasized that, contrary to popular belief, management is not the province of the specialist. It is basic to the officer function, contributing to the authority of command. Every officer, whilst keeping his professional knowledge up to date, must therefore also receive management training appropriate to the differing requirements which advancements in rank dictate.

Much that is management is not new. Indeed, many detractors genuinely consider that the term is no more than a pseudonym for principles and methods which have stood the test of time. It is true that the requirements of administration and organization have for long been widely understood in the Service. Management, however, makes additional concepts and techniques available to the commander and staff officer, to provide the change in emphasis that is the vital difference between mere effectiveness and efficiency.

The Application of Scientific Method in the Royal Air Force

The invention and improvement of weapons and equipment has and will always

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remain the chief contribution of science to warfare. Between 1939-45 however, science assisted military conflict in a new way, being applied to the conduct of operations and the employment of weapons. Thus was born Operational Research (OR). To avoid confusion between this subject and the established field of Operational Requirements, the initials of which are equally freely used for identification, the term Operational Analysis has been adopted by the Royal Air Force to include the many techniques of quantitative decision making, of which linear programming, simulation, game theory and queuing are examples. Operational Analysis has been highly developed in the industrial situation and also has considerable application to the Royal Air Force. The decision maker often has various strategies available to him which yield different results in terms of his objectives; for example he may have to decided whether additional missiles should be mounted on an air defence fighter and thus increase its kill capability if to do so would take '*X*' knots off its speed, thereby reducing the chances of closing with a hostile aircraft. The analyst can reduce some of the imponderables.

On occasion the conduct of operations can be more important than improvements in individual weapons. Technical excellence can become strategic nonsense if accurate strikes resulting from meticulous training are directed against other than the most operationally advantageous targets. Moreover, with further development linear programming, allocation, replacement and queuing theory can be applied to administration, logistics and communications with comparable success to that achieved with operational problems.

The potential of operational analysis is not entirely due to the elegant construction of its mathematical models. The development of the modern computer has enabled these techniques to be exploited to the full by providing the means of dealing with the volume of calculations which analysis of alternative strategies often entails. In addition cost effectiveness studies, work study and the whole field of planning and control are other scientific management practices now available to the decision maker.

Human Relations

Whilst the employment of material resources may be optimised with the assistance of techniques based on the use of scientific method, the application of science to the direction of human activities remains an enigma. The great debate concerns the extent to which behavioural science, concerned with the psychological bases of motivation, individual and group behaviour and the study of organizations as social systems can be treated quantitatively. Except in psychology, where intelligence and attitudes can be measured, developments are yet at an early stage, and it will be many years before all the answers are known.

Even now, however, behavioural science can help us to use manpower, our most valuable resource, efficiently. Human relations studies give an appreciation of motivational factors, of the personal aims and the aspirations of ones subordinates, which can ease the task of those who have to use people to get work done. Organization studies can help to develop the structure which will reduce the waste which attends upon excessive personnel establishments, although there must be a willingness

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to pursue reductions with at least that enthusiasm which has attended past recommendations for increases.

THE TASK FOR MANAGEMENT

Modern aircraft and equipment have become the subject of swingeing price increases both in capital outlay and routine operating costs, even compared with their counterparts of ten years ago, and this escalation in costs will inevitably continue. We know that by the mid-70s the defence vote will be reduced from the 67-68 figure of £2,200 million to £1,800 million. The result of rising costs and declining revenue will clearly reduce our overall capability unless special measures are invoked to improve productivity and efficiency in all spheres of Royal Air Force activity. Manpower wasted, or expended on nugatory effort, will cause a further drain on our reducing financial resources and will ultimately affect the fighting efficiency of the front line.

There is a clear need for a critical approach to the current methods used to determine the employment of manpower and material resources, in order to improve the utilisation of both without increasing either. Objective planning, problem solving and decision making based on qualitative considerations rather than intuition, together with the introduction of control related to objectives, are means which can and must be introduced. In many areas, management concepts can be introduced and monitored by commanders and staff officers with no more than basic management training. However, on those occasions when intricate techniques have to be developed, recourse must be made to the operations analyst or the work study specialist.

CONCLUSION

The attributes of the commander and staff officer may be considered under the three headings of professional knowledge, administrative skills and personal qualities, although such divisions are not mutually exclusive. This article has sought to show that management provides that administrative skill which enables the commander to achieve his aim with optimum efficiency. As such, the practice of management is an integral part of the officer function, untrammelled by branch specialisation.

The inculcation of management practice develops an objective, critical approach to both current methods and new plans, which ensures that the fullest possible use is made of our resources: as such it has an important part to play in increasing the efficiency of the Royal Air Force in the 1970s.

PRIZE WINNERS

GORDON SHEPHARD MEMORIAL PRIZE ESSAY COMPETITION—1967

FIRST PRIZE: Air Vice-Marshal W. Carter, C.B., D.F.C.
SECOND PRIZE: Squadron Leader R. F. Grattan.
THIRD PRIZE: Squadron Leader Duncan Allison.

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LETTER TO THE EDITOR

From Wing Commander H. R. Allen, D.F.C., R.A.F. (Retd.)

Can I suggest to Air Marshal Sir Robert Saundby that Britain now possesses three separate air forces; also that the United States possesses at least four and, depending on how you look at it, might even possess a dozen? My basic point is that Britain cannot afford three air forces but could afford two which would be equally effective.

On his point that the R.A.F. was created to avoid waste, etc., it is of interest to observe that Lloyd George's instructions to Churchill on assuming the duties of Secretary of War in 1919, included the words 'Take the Air with you. I am not going to keep it any longer as a separate ministry.' Hardly, one feels, a philosophy containing any optimism that the creation of a separate air force had ended waste, etc.

The proposition in the Charter of the R.A.F. published at the end of 1919 stated 'The first duty of the R.A.F. is to garrison the British Empire.' This was at a time when the French air force was a menacing threat just over the horizon. It was the vital kernel of the nut that allowed the perpetuation of the R.A.F. as a separate service during the bloody Whitehall paper battles of the 1920s. The bombing without occupation theory succeeded in the short term but failed in the long term. Occupation brings with it such niceties as the building of military roads. This allows for quick incursions in the future. Aden is today such a difficult area mainly because it was bombed but not occupied. There was, in other words, no possibility of nipping things quickly in the bud.

The vital legacy of that policy was, however, the suggested solutions at the Staff College. Air superiority was inevitably the R.A.F.'s as a sort of right. The tribesmen may have had blunderbusses but they certainly never had aircraft in defence. If one looks at this hard enough, one will see how it coloured the order of battle of the R.A.F. and the equipment policies. Bombing — against Germany! — would be achieved mainly by day. There would be no need for escort fighters because they were never needed over the North West Frontier. Our bombers could cope with .303 inch machine guns and they required no armour plate nor self-sealing tanks. Bomb development was virtually ignored because existing stocks did very well against mud huts. Worst of all, it was never necessary for the R.A.F. to *fight* for air supremacy because it was never necessary over Iraq. Also, Trenchard had laid it down that air defences could be evaded, but they could never be evaded for long on any basis of cost/effectiveness.

I would be extremely grateful to Sir Robert Saundby if he would give his views as to why the R.A.F. never attempted to fight for air supremacy over Germany in the last war. His views would be of the utmost importance if only because he is one of the few men still in a position to give an explanation. To me, as a student of aerial strategy, and to many like me this would be of historical importance.

(The points raised in this letter, and in other letters and articles on this important subject, will be dealt with fully in the Spring, 1968, issue of the Quarterly.)

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The Air Forces in Parliament

By Wing Commander R. F. Pemberton, M.C., T.D., M.A., R.A.F. (Ret.)

On 19th July, 1967, the British people got a shock. Their morning papers announced, in suitably prominent headlines, 'a 20 per cent cut in the size of Britain's armed forces.' Full—or at least fairly full—details were contained in a special Defence White Paper,* which had been issued by Her Majesty's Government on the previous day (18th July, 1967). These details included 'a complete withdrawal from Singapore and Malaysia by the mid-1970's.' To say that this came as a surprise to the British public is a moderate statement. It was a shock! We had been repeatedly told by Government spokesmen that no complete withdrawal from these far-eastern commonwealth countries was contemplated; and now we are faced, if not by a *fait accompli*, at least by a firm decision. Well, we must accept it—as we have done before. It shows that we are living in a period of peace (we must, it seems, disregard the 'cold war'); for our readers will know only too well that it is the policy of the British Government to cut down our armed forces in peace-time and to find themselves unarmed and unprepared when another war threatens. 'When will they ever learn?'

NATO and the Far East

Before commenting on the policy as a whole, let us first examine it in detail. In Europe the Government consider it 'essential to maintain both the military efficiency and the political solidarity of NATO'; but, in order to reduce the foreign exchange costs by £5½ million, it will withdraw to the United Kingdom one infantry brigade and one R.A.F. squadron early next year (1968), while keeping them both, or their equivalents, assigned to and available for service with NATO in an emergency.

Outside Europe, assuming that we can best help our Allies by providing the sophisticated military elements they lack and that our overseas bases may be costing more than is justified by the type of military operation for which they would probably be used in the future, the Government have decided that it will be more economical to keep most of our troops at home and to send them by air, at short notice, to any trouble spot in a crisis. Accordingly, the British military garrisons of Singapore and Malaysia are to be reduced from their present total strength of 85,000 soldiers and civilians to 45,000 by 1971. The latter figure will include 25,000 Service men (including the redoubtable and indispensable Gurkhas) and 20,000 civilians (including locally enlisted uniformed personnel). But that is not all. The British forces remain-

* Supplementary Statement on Defence Policy 1967 (Cmnd. 3357, H.M.S.O., July, 1967, 2s. 0d. nett). For debates in Parliament, *see* Hansard: House of Lords, 25 July, 1967; *and* House of Commons, 27 July, 1967.

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ing in Singapore and Malaysia after this reduction, which will consist mainly of Royal Navy and Royal Air Force personnel, including an amphibious force, are not to remain there indefinitely but are also to be withdrawn *in toto* by the mid-1970's. The actual date for the final evacuation has not been fixed. It must obviously depend on the international situation at the time; and the Ministry of Defence has wisely stated that the whole of these plans must depend for their fulfilment on a favourable international situation.

It is also stated in the White Paper that our obligations to the South-East Asia Treaty Organisation will continue to be honoured, though the forces previously assigned to SEATO will be changed from time to time. As Australia and New Zealand both have vital political interests in South-East Asia, they will naturally have been consulted before the foregoing decisions were taken and as to the manner of their implementation; and they are now being consulted about the future of the Commonwealth Brigade, from which some personnel will have to be withdrawn. H.M. Government realises, and has specifically stated, that there may well be occasions in the future, after our final withdrawal from Singapore and Malaysia, when we shall have to send troops again to the Far East for operational purposes; and for that reason they are continuing to explore the possibility of establishing a staging and training base in Australia and a staging post on one of the British islands in the Indian Ocean.

Navy, Army and Air Force

How does all this affect our armed forces? Within the four years from April, 1967, to April, 1971, the following reductions in uniformed manpower are intended: The Royal Navy from 97,050 (actual) to 88,400 (estimated); the Army from 196,200 to 181,200; and the R.A.F. from 124,110 to 110,500. These figures give an overall reduction by 1971 of 417,360 to 380,100—a nett loss of about 37,000 in four years; but by the mid-1970's the complete reduction will have become 75,000. Proportional reductions in civilian employees are also planned, so that by the mid-1970's they will be 80,000 fewer, of which 30,000 will have been employed in Britain.

During this process of reduction, 2,500 officers and men will have become redundant *each year*, and these will be compensated with redundancy grants and by being given facilities for resettlement training and help in finding suitable jobs in civil life.

A significant paragraph in the White Paper concerns the Royal Navy. 'From the middle 1970's,' it says, 'the main striking power of the Navy, apart from the Polaris submarines, will be the growing force of submarines;' and 'after the last aircraft-carriers go, the Royal Navy, like the Army, will rely on R.A.F. land-based aircraft to support it.' (The aircraft-carriers *Victorious* and *Hermes* will be 'phased out' in 1969 and 1970 respectively; *Ark Royal* and *Eagle* will continue in service until the mid-1970's.)

'The basic role of the Royal Air Force will remain as described in the Statements on the Defence Estimates 1966 (Cmnd. 2901) and 1967 (Cmnd. 3203); but the size of the front line will be reduced. More aircraft will be concentrated in Britain; the

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increased mobility, range and performance of the new aircraft make this possible. The reductions up to 1971 will occur mainly in the Far East, Aden and Malta; four squadrons of aircraft will be moved from Aden to the Persian Gulf and one from Germany to this country.'

The policy summarised above has two aspects: the reduction in expenditure and the shedding of some of our commitments overseas. Let us consider these in turn.

Defence Cuts

The official reason, which in this case may be the real reason, for the reduction in defence expenditure is financial. According to the Government's financial advisers, the country cannot afford to spend more on defence than £2,000 million *at 1964 prices;* and these cuts are designed to satisfy—and more than satisfy—them. Let us admit that it is unsound finance to commit the country in advance to expenditure beyond its means; but there are ways and means of avoiding over-expenditure, and the cutting of defence expenditure is only one of these. More money could be raised to meet necessarily increased expenditure; and if our industries were allowed to develop and expand as they could, revenue would be increased without the imposition of additional taxes. Alternatively, and still without extra taxation, revenue could be diverted from other (and possibly less important) channels of expenditure into that of defence. From what other channels? It is not for us to say since we are not in possession of all the facts; but the social services immediately spring to mind. Cries of protest from all who are in receipt of national benefits—and that includes nearly all of us! But, seriously, defence is surely as important as the N.H.S. and the other social services; for, quite apart from the possibility of our being economically controlled by a foreign power, weakness in defence handicaps our negotiating in the councils of the world. It not only reduces our prestige, but it may also lose us markets and even some sources of food supply. And, though there be no threat of war for us now or in the foreseeable future; modern armaments, weapons and delivery systems take so long to produce (from requirement to delivery) that we are bound to plan well in advance for unknown—but surely predictable—eventualities.

This self-imposed limit of £2,000 million at 1964 prices is one of the most arbitrary limits ever suggested for the defence budget. How can anyone so determine our needs? The proper course would surely be to examine our necessary commitments at home, in Europe and elsewhere overseas, reduce them to a reasonable minimum, and then plan our defence forces economically to fulfil those commitments. This would give a total cost, which might exceed the arbitrary limit mentioned above but would certainly enable us to fulfil our obligations and not 'lose face' among the nations of the world. 'Face-saving' is not mere sentiment or idealism; for loss of face is ultimately and inevitably reflected in reduced material circumstances. While no one wants to spend money on defence beyond the level of reasonable security; it cannot be too strongly emphasised that too much saving on defence at the present time may well involve us in vast and sudden expenditure in the future, which could be avoided by a wise and enlightened policy today. So much for the first aspect and now for the second, the shedding of our commitments overseas.

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'Ichabod'

Sir Winston Churchill is reported to have said, during one of his tours of duty as Prime Minister, 'I did not assume this office in order to preside over the dissolution of the British Empire.' Well, he got out just in time. The British Empire as it used to be is rapidly dissolving and most of it has gone; though it remains, we like to think, in the form of the Commonwealth. Let us admit that Britain cannot afford, and is no longer called upon, to police the world as she did during most of the nineteenth century. The *Pax Britannica* was a very real thing, but it has now ceased to be; and some say that in its place is the *Pax Americana*, which is a very different thing. It is no longer possible for one Great Power to dominate the world—as Britain used to do, in the kindest possible way, with her Navy. The peace of the world, such as it is (and ignoring Viet Nam for the moment), is maintained by what is sometimes called the 'balance of terror' or, in other words, by the nuclear deterrent; and under this awful threat nations still fight limited and conventional wars, as they always have done, to settle their real or supposed grievances. And it is for these, as well as for a major war, that we have to be prepared with adequate forces at the right time and in the right place. Our future policy, in this regard, seems to be to keep nearly all our troops in the United Kingdom and fly them out hurriedly, in times of political tension, to any place where a crisis is imminent or actually occurring.

This, we venture to think, is not good enough. There is no adequate substitute for the British presence in the form of well-disciplined, well-equipped, well-turned-out and well-trained British troops, be they Navy, Army or Air Force, or all three. Aside from local and temporary animosities, which are national or ideological rather than personal, there is no more popular Service man than the British sailor, soldier or airman; and his very presence in the trouble spots of the world has often prevented a crisis or damped it down before it got out of hand. Prevention is better than cure, and this is how crises can largely be prevented. Are we to throw away all this for the sake of saving a few hundred million pounds, which—and much more than which—could easily be 'poured down the drain' if a serious crisis arose and got out of hand before our troops could be assembled, equipped, flown-out, acclimatized and trained to deal with it.

Conclusion

In the Conclusion (Chapter VI) of the White Paper, H.M. Government state: 'We have been working continuously for almost three years on a major review of defence, formulating the role of military power to support it, and planning the forces required to carry out this role. This Statement marks the end of that process.' No doubt this is so, but surely the British public, and particularly the Services, should be given at least a summary of this 'major review'. Both the troops who have to implement the policy and the public who foot the bill are entitled to know these things, provided always that national security is not compromised by publishing them.

Finally the White Paper says: 'The Services will continue to have the indispensable task of safeguarding national security, supporting Britain's overseas policy, and keeping the peace. The Royal Navy, the Army and the Royal Air Force, though reduced in size, will be capable of meeting all the demands that may be made on them.'

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HOLIDAYS ABROAD WITH THE CLUB MEDITERRANEE

By Group Captain W. Beringer

Sailing instruction at Caprera

SOME are more lucky than others. It has been my good fortune to have been stationed on the Continent for the best part of four years: first in Paris and then in Rome. Holidays abroad have therefore come naturally, as it were. This article is about a special type of holiday which is offered by a French organisation called the Club Mediterranee. The main reason for raising the subject at all is because it is not generally appreciated that the Club offers a holiday with adventurous possibilities for the young and middle aged alike—indeed the type of holiday which would probably appeal to Air Force people everywhere. Rest assured the writer has no commercial connections with the Club, nor have they commissioned him to write about it.

How the Club is run

The Club is a French undertaking which has a number of "villages" scattered around the Mediterranean. Club members always refer to their holiday place as a "village", never as a "camp" because the word "camp" has unpleasant wartime connotations for some continental Europeans. There are villages in Morocco, Italy, Greece, Sardinia, Corsica and Israel. My two holidays with the Club were spent last year at Arziv in Israel and this year at Caprera, in Northern Sardinia. There is no problem about becoming a member: one simply pays a small fee to the Organisation and you're in.

Villages are organised in a similar fashion everywhere and costs are kept relatively low by making living conditions simple, some might think primitive. Members sleep in grass huts, each of which contains two beds and little else. Washing facilities, showers and washbasins (cold water only) are in blocks interspersed amongst the huts, much the same as on old wartime R.A.F. Stations. Men and women share the same ablution facilities and this helps enormously for members to get to know one another. It is impossible to be pompous and stand-offish cleaning ones' teeth next to an attractive blonde in a bikini, first thing in the morning or last thing at night.

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There is a large whitewashed dining hall in front of which are tables and seats made of concrete: no table cloths. However, each table has a gay sunshade and they are usually interspersed amongst trees overlooking the sea: the effect is charming. Each table seats eight and conversation at meals is usually in French; but "English only" members can always find someone to talk to. There is a large bar and next to it a dancing arena and stage for the band which plays every night. Drinks are paid for with multicoloured beads which are obtained by signing a chit which is later charged against ones account: cash is never used.

The "chef" or head of the village has under him all the staff who make it run. These include the hostesses, the instructors for the various sports, the band, and administrative staff. They are nearly all young people in their early twenties: mostly French, though there were a few British staff members at both Caprera and Arziv.

Facilities Available

These vary little between villages: some concentrate on one or two particular types of sport, for example, skin diving and sailing at Arziv and Caprera; but one thing is standard and that is the excellent siting of the villages on lovely sandy beaches. The beach is the basis of most Club activities, which are largely connected with the sea. (The Club also has skiing villages but we are not concerned with these in this article.)

Swimming and sunbathing are of course pastimes enjoyed by nearly everyone. Fishing using masks, schnorkel tubes and underwater guns is also very popular. Only a few enthusiasts fish the ordinary way with rods and lines! Sailing is the most popular sport of all. There are large boats in which groups of beginners are given instruction by competent instructors and smaller, sporting type sailing boats in which they go "solo".

There is a very active skin diving club at Caprera. The clear water and interesting rock bottoms strewn with ancient Roman relics make this village one of the most popular skin diving places in the Mediterranean. Members of the British Sub Aqua Association stay at the village every summer, primarily for this sport. This is a sophisticated sport which requires a fair amount of training and a high standard of fitness from the participants. Each skin diving aspirant must first pass swimming and diving tests, the latter using an ordinary mask and schnorkel tube. There are a number of bi-lingual qualified instructors at each village who take the beginner through from the initiation stages to the final full-scale dives complete with oxygen bottles. In passing, this sport is not confined to men only: some of the more sporting girls become very good at it. No great physical strength is required: simply a love of the sea; good lungs, an ability to swim well; and considerable nerve. It is a dangerous sport: two diving enthusiasts were drowned at Caprera in the space of a few weeks last summer. A number of old Roman earthenware jars, probably used for storing water and wine on galleys, and other oddments, are brought up often by skin divers at this village.

There are physical fitness classes every morning. Picnics and walks to places of interest are also organised. Other sports include: riding, rock climbing, tennis, fishing, volley ball and "boule", the French equivalent of bowls.

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Bivouacs and Excursions

Bivouacs and excursions are important activities of village life which merit special attention. Bivouacs are short visits away from the village where members usually spend the night in the open, sleeping on the beach in a sleeping bag. For example, once a week the Sailing Club will load its boats with provisions; the personal effects of the members wishing to go on the bivouac; pots and pans, knives, forks and spoons; a liberal quantity of wine and spirits and sail off to a sandy cove some miles from the village where the boats are beached and unloaded. Everyone joins in and helps with the cooking and washing up. Usually a camp fire of driftwood is lit and there is singing and party games whilst the wine lasts. Exposure to the sun, heat and flies, followed by an uncomfortable night amongst the sand dunes is not everyone's cup of tea; but a surprising number of members seem to enjoy it.

Excursions are made to places of interest in the country in which a particular village is situated. Many forms of transport are used—land rovers, buses, amphibians, etc., depending on the type of excursion. The same applies to accommodation—hotels, tents, huts, whatever can be made available in the vicinity. A good example is the system in force at Arziv in Israel. Excursions of a few days duration are made to Jerusalem: transport is by bus and members stay in hotels. On the other hand, there are excursions to the Gulf of Aquaba of over a week's duration on which members proceed by land rover, and camp in the desert en route. Bivouacs and excursions are extras and their cost is additional to the normal holiday tariff.

Cost of Holidays

It is not intended to go into detail about this as costs vary widely depending on the distance of the village from the point of departure. Arziv and Agadir (in Morocco) would probably be the most expensive for British people. The Club makes block purchases of tickets and sometimes charters aircraft, which reduces costs considerably. There is a Club Mediterranee office in London which will provide all this information.

Conclusion

It is sometimes bandied about that conduct between the sexes in Club Mediterranee villages leaves something to be desired. The majority of females in the villages are French and this impression of loose living at Club villages probably springs from a widely held belief that Frenchwomen have loose morals. Speaking from experience, the average Frenchwomen usually has down to earth views about sex but she is certainly not particularly prone to put these into practice; and indeed provincial Frenchwomen are positively prudish. The promiscuous Frenchwoman is largely a myth. On the whole moral standards in Club villages are reasonably high. It can be said with confidence to mothers that you need not restrain your daughters if they wish to indulge in this type of holiday; and your sons are likely to be disappointed!

Dancing in the warm evenings after a good dinner, with the waves breaking on the beach nearby, goes on usually until about midnight. Then to bed to sleep like a top and prepare for another day.

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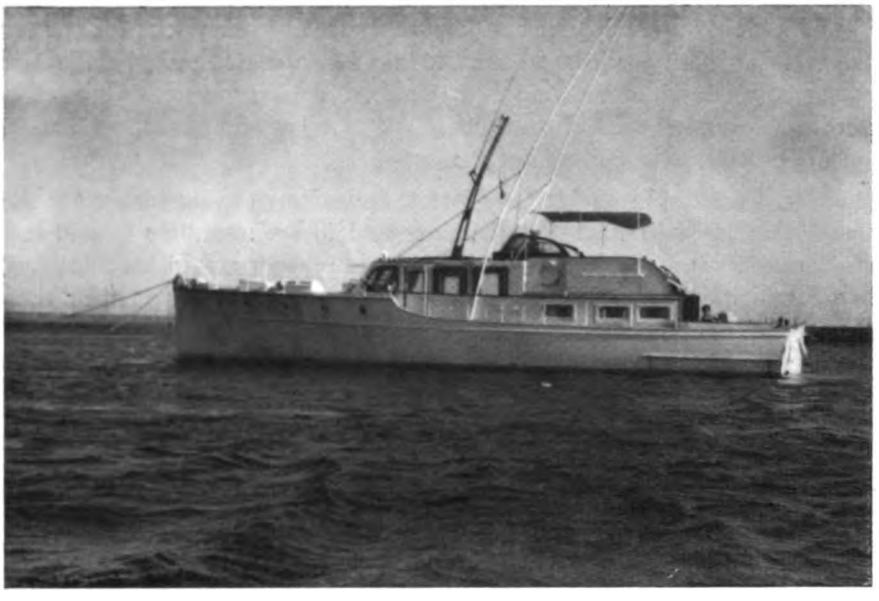

Author's 52 ft. twin-screw Diesel Yacht in the Canaries.

Fishing in the Canary Islands

By Henry C. N. Anderson

I FIRST visited the Canary Islands in February, 1965, and after a few days soaking up the sun I turned to the main reason for my visit—Game Fishing. Although advertised as being available I was unable to find a boat properly equipped for the purpose, and the small double-ended local boats of the fishermen I found too uncomfortable, combining as they do a good soaking with a strong stench of stale fish and diesel fumes.

But there were plently of stories of big shark and tuna (Tunny) to spur me on, and after going home I made numerous enquiries about the possibilities of starting a Game Fishing Club. Encouraged by what I found I returned in February, 1966, with a fully equipped 52 ft. twin-screw diesel yacht. I had not been able to understand why, with Tourism very much on the increase, someone had not already tried a charter business, so I was thorough in my enquiries. But it was not until I arrived in the Canaries that I found the reasons.

The Island law says quite firmly that to import a yacht you must be a resident of at least two years standing, and the gross tonnage must not exceed twenty. It does not allow the importation of boats for commercial purposes—especially fishing!

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Here was I, newly arrived, trying to import a yacht of thirty tons for commercial purposes. Also, many yachts use Las Palmas as a stepping off place for the Atlantic, and some have left without paying their bills, and previous owners of big fast motor cruisers have been involved in smuggling. With the law and official opinion against me my cause began to look like a lost one.

However, I decided to tackle the problem by gaining the support of the Tourist Bureau—whose faith can move mountains—and in the meantime to find the best base. I had four requirements: — a tourist centre with a safe harbour; facilities for the handling of small ships, including fuel, water, ice and bait; ready access to fishing grounds, and finally, reasonably sheltered water. At that time there were only two safe ports in the Canary Islands—Santa Cruz in Tenerife, and Las Palmas in Gran Canaria. Both highly desirable from the tourist density point of view, but both far too busy to be bothered with the needs of yachts and small demands on their time, and in any case too far from the fishing grounds to be of use. The best compromise seemed to be Arrecife de Lanzarote, which, although having a low tourist density was scheduled for expansion. Arrecife, with a population of 25,000 inhabitants is the main fishing port for the Islands, and now has an excellent harbour.

Arriving there I had to face scepticism and suspicion, and without official permission I dare not advertise. My first task was to catch fish, without knowing where to catch them—and when I caught two large Hammerheads off the entrance to the harbour I found myself with a two-edged sword. The news quickly brought customers, but the authorities, stressing the safety of their beaches, were not happy at having shark caught so close to shore. I resolved not to make this mistake again, although the interest it aroused gained me local official support leading to official recognition and permission. Up to that point they had not believed it possible to take a shark on rod and line.

The Canary Islands lie in the cold south-flowing Canary Current, and the main fish stream keeps to the African Coast in the warm north-going current. The type, quantity, and variety of fish around the Islands varies with the relative strengths and directions of these two currents, being plentiful in May to December, and practically disappearing in February and March. The water too is very clear—it is possible to see the bottom at 60 feet—so that the heavy tackle needed to hold the big fish is too easily seen. This calls for a rather special technique to coax the fish to the surface, and at the same time adds to the thrill.

The normal practice is to troll in the hope of picking up Tuna, Barracuda, or Pompana while proceeding to the shark grounds, always on the lookout for a fin en route. Once there the area is "seeded" with blood, and fine nets filled with mashed sardines dangled in the water over the side. The idea is to attract the shark to the surface through his sense of smell, and then go after him with a 6 - 8 pound fresh bait. The line from the bait is led through a special release clip at the top of the outrigger—hallmark of all game fishing boats—and then to the rod and reel. The height given by the outrigger and the boat movement through the water, make the bait plane and splash to resemble a fish in distress on the surface, and the moments when

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the shark sees this and closes in on a curve of pursuit are both awesome and exciting beyond words. As soon as he hits the bait the release clip lets go the line, the fisherman sets the hook as he feels the fish, and the fight is on.

Although blood and smell will excite shark to the point where they will attack, the difficulty lies in getting them and the blood together. I found that running at a particular r.p.m. on one engine, the shark came around much more quickly and in greater numbers, in response to some high frequency vibration. The difficulty here lies in isolating the frequency, and much work remains in this field both to find an attraction as well as a repellent. Spear fishermen, in particular under water, find that the "panic" or "pain" signals given by a speared fish will invariably attract shark if they are in the vicinity.

I did not find Mako nor Broadbill Swordfish in any numbers, and only at certain times, but huge Hammerhead and Blue sharks are plentiful. The World's record Blue shark was recently caught off Las Palmas. Tuna and Barracuda abound, and also big Manta Ray. One such species which we found basking on the surface was over sixteen feet across and weighed over a ton—on estimate, having broken our strongest tackle three times in fifty minutes. I know where you can buy cheaply a very short glass-fibre rod and several pieces of line.

READERS CRITICISMS INVITED

We hope the contents of this Journal comes up to the expectations of subscribers.

Our ambition is to please *all* of our readers *all* of the time; perhaps this is too ambitious!

It would be very satisfying if we could meet the approval of *most* of our readers *most* of the time.

The only means of doing this is by subscribers sending the editor their observations, criticisms and suggestions as to the kind of articles that interest them and, of course, those that do not.

Our aim is to produce a journal of a standard high enough to be worthy of our Air Forces, and one that is at least comparable with those of other Services.

It would be greatly appreciated if our readers would co-operate with the maintenance of this aim by writing to the editor in time to include their suggestions in the planning of the contents for issues in 1968.

EDITOR.

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AN OUNCE OF EXPERIENCE . . .

By Philip Knox

IN my student teacher days, my tutors did their best to convince me that for a schoolmaster to rely on a little learning was not only a very dangerous thing, but a short cut to scholastic suicide.

"Know your subject *thoroughly* before you ever dare set foot in class," they said. "Preparation is vital—but be prepared for the worst. Remember—there's always, at least, *one* budding genius who'll be delighted to teach *you* a lesson."

Fortunately, I was to learn the practical application of this basic pedagogic principle, not in the 'catch-as-catch-can' of any blackboard jungle or 'thrust-and-parry' of a playing field, but in the comparative calm of a battlefield—at Waterloo.

It happened during the latter stages of the Second World War, when my R.A.F. unit 'rested' for a few days, in the small Belgian town of Nivelles, nineteen miles south of Brussels, and about eight miles south of Waterloo itself. The day before we arrived, one of Hitler's V-bombs had blasted out the windows of the school in which we were to be housed, and, listening to the inevitable grumbles at the inconvenience of it all, I remarked scornfully to Tommy, our N.C.O. in charge of transport, that it would have taken more than a 'doodle bug' to have shaken The Iron Duke's morale, at Waterloo.

And that was a very rash statement to make to a long-service 'old sweat', who was not only utterly contemptuous of the opinions of conscript and volunteer alike, but who was an avid and thoroughly knowledgeable amateur historian. He didn't need half a chance to vaunt his professional superiority over a mere 'duration only toy soldier', like myself.

He suggested that to fill in time before our next move, the unit spend a whole day at Waterloo to re-enact Wellington's victory of 18th June, 1815.

"An you're the chap to take charge," he assured me, with what I strongly suspected was only simulated respect for a schoolmaster who had yet to step inside a classroom in anger. "You're the only perfesser 'ere, an' you'll know all abaht these 'ere Napoleonic Wars, an' that. Tell y' what— we'll split the unit between us. You be Dook an' I'll be Nap. What abaht it?"

It's very difficult opting out of a situation which promises unexpected kudos, but it's equally hard overcoming doubts about one's capacity to cope—especially with a sketchy outline of history, in general, and of Waterloo in particular.

But the decision was taken out of my hands when, barely ten minutes later, Tommy confronted me with what he declared was the concerted opinion of a hastily-convened 'general' meeting that such a project would be both highly educational and a welcome break from the airman's usual off-duty pursuits. *And* I had been unanimously

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elected as Director of Education and leader of one of the opposing forces. Tommy was a most persuasive fellow!

In the face of such a devastating frontal attack, I capitulated with as much diffidence as I thought the situation demanded.

Then, official approval having been sought and given—a mere formality with Tommy—we made our preparations.

To begin with, for no particular reason (which I was to regret later), I decided to 'play' Wellington, leaving Tommy as the obvious choice to lead the French. As a concession to 'top brass', Tommy cast 'Libby', one of our senior officers, as the tardy Marshal Prince Blucher, in charge of our Prussian allies.

That done, more to give myself time to think and to ferret out any local literature and knowledge than anything else, I told everyone to collect as many authentic weapons of the Napoleonic period as possible, while I set off on unobtrusive forays into Nivelles to make what turned out to be unproductive enquiries of the inhabitants. The 'locals', it seemed, were far more concerned with outcome of *their* war to care about what happened in a history book, and it was useless pointing out to them that, but for an accident of birth, Napoleon, and not Hitler, might have been their oppressor.

So, I had to fall back on my 'Tourists' Guide To Brussels', picked up a few months before, and which gave only a minimum of details and a small map showing the disposition of the respective forces. I might have risked a clandestine visit to the capital's archives for more precise information, but I was sure that such a quest, however subtly engineered, would almost certainly have been detected.

I had another problem. Tommy had a theory that had Napoleon's manoeuvres been less predictable—Wellington described them, in a letter, as movements forward 'in the old style'—the British might well have lost the day long before Blucher's tardy assistance settled the issue in our favour, in the later afternoon.

"I bet you if anything unexpected 'appens, on Thursday (the day of our 'outing'), the way The Dook took up 'is stand, you won't 'ave a charnce. Another thing—old Blooker was dead lucky t' get there when 'e did. You'll see! "

Of course, as Director of Studies, I couldn't let Tommy get away with that, and my imagination was kept at full stretch, as I propounded fanciful theories in defence of Wellington's strategy. In the end, we did manage to agree that the solution would only become apparent in actual practice. I was beginning to see now that, instead of a pleasant dramatic interlude, the whole thing was going to develop into Tommy's private war—a sort of professional soldier versus civilian gentleman match—applying Tommy's usual attitude in these things.

During my briefing, the night before the contest, both factions agreed to keep strictly to the framework of the action, although it was decided that if any act of God or war should catch either commander unawares so that the actual result should be affected, the other side -- British or French — should be adjudged the winner. Well, I'd studied my guide until I could repeat chunks off by heart, so I was pretty confident that Tommy would find no loopholes in *my* tactics.

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Anyhow, next day, Thursday, somewhat later than schedule, a procession of lorries and jeeps set off loaded with an assortment of dummy bullets, rifles, revolvers, swords, bayonets, food, and as many creature comforts as space would allow — not very authentic, but sops for the lukewarm.

As a further appetiser for our reluctant heroes—a minority, I'm glad to say—I decided that we should begin by visiting the Panoramic painting of the battle, housed in a circular building, adjacent to the field. This realistic work, by a French painter, depicting the more exciting episodes certainly served its purpose in stimulating the imagination of even the most insensitive. And, after we had climbed the hundred and thirty-six feet high knoll outside to inspect the Lion Monument, at the top, and to take in the battlefield itself, it was a case of "Let's get down an' at 'em! "

Well, we'd spent so much time sight-seeing that Tommy and I had to draw up a telescoped time-table. Besides, it was clouding over and there was a hint of thunder in the air. It would be somewhere around three o'clock—the original engagement would have been half-over by then—when we parted to supervise the entrenchment of our strongholds.

It was then that I ran up against a totally unforeseen obstacle. According to my guide book, Wellington had occupied the plateau of Mont St. Jean, about two miles south of Waterloo village, and had held three carefully-barricaded forward positions at the farms of Hougoumont, on his right centre, Haie Sainte, on his right, and Papelotte, on his left. The map was far too small and blurred to use as a handy reference.

To ensure absolute reality, we should have occupied, at least, part of these sites. But, when we descended en masse on the mystified tenants, we met only suspicion and, at Papelotte, open hostility.

I hoped secretly that Tommy was having the same trouble, at La Belle Alliance, about a mile to the south, across the valley.

We withdrew tactically and tactfully from Papelotte, and only after much bargaining—and not a little 'persuasion'—did we finally convince the residents at Hougoumont and Haie Saint that we were merely a bunch of Allied amateur actors in search of living history—and not an advance party of a German counter-offensive.

So, leaving a forty-strong group to repulse attacks at Hougoumont, we drove off frantically to Haie Sainte, ready to cede the position, after expending all our ammunition in the late afternoon, exactly as Wellington had done.

We had barely time to settle in before sighting the enemy advancing steadily—but making no attempt whatsoever at evasive action. They just came into our fire line and, like a suicide squad, turned and retreated, leaving a succession of casualties.

Tommy seemed to have become slightly mixed, so I instructed my men to hold out a little longer, before surrendering.

Then, in true military tradition, I careered back to Hougoumont to sustain my men in what they expected to be their finest hour. But, here again, it seemed that Tommy was intent on throwing away the game—he certainly wasn't playing according to our agreed rules.

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His troops were making a determined full-scale assault on our right-centre bastion! Either he had deliberately flouted all our military agreements of a sportsman's war or his forces had failed to understand orders. I inclined to the latter view—Tommy was really a fair fighter!

I rushed back to Haie Sainte. Still stalemate! Unless Tommy speeded things up a bit, it would be dark, and, judging from the sky, we should be caught in a thunderstorm.

I gave orders for immediate capitulation.

Whether our antagonists thought we were merely playing possum or being ultra-polite, I had no time to judge them. In fact, we had to walk out brazenly, with hands raised, to convince them that *they* were supposed to capture *us*!

No one had seen Tommy for some time, so I had to withhold my verbal ammunition and dash off to see what confusion had been stirred up at Hougoumont. If this was Tommy's idea of a very bad joke, I decided to play along for a while.

The thunder was now giving realistic sound effects, and it would be a pity not to take advantage of such a made-to-measure scene—I decided to pile on the comedy and order my defenders to come out and attack.

But Tommy had left his H.Q., at Belle Alliance, and was already directing operations and urging on his men as if he meant to outpace Monty in the race to Berlin. This was the absolute limit! His attacks on Hougoumont should have petered out some time ago. There was nothing for it now but to hold on until 'Libby', as Blucher, arrived to tip the scales in my favour.

We held on, all right, Tommy's men dropping out as they were 'shot'—at least, he didn't blunder in *this* respect. But it was a race against time, and, finally, darkness and the farmer threw in their lots with the enemy to force our hand. 'Libby' had let us down with a vengence!

Much sadder and wetter, but very little wiser historically, we returned to our billet to find our Haie Sainte group already there, but no sign of 'Libby' and company—even Blucher wasn't as late as that!

But 'Libby' was forgotten when Tommy took the floor, claiming complete victory for the French and asserting that I should have been prepared for *all* contingencies —including Blucher's non-arrival.

It looked like unconditional surrender until I taxed him about his impromptu tactics.

"What!" he shouted. "*You* talk abaht me not stickin' t' the rules! What abaht 'Aie Sainte—it was *you* who was supposed t' give in, didin't y' know!"

Well, no less heatedly, I pointed out that we had been only too willing to accommodate him if he'd shown any intention of taking our right flank position. And what about Hougoumont? What was he doing trying to capture our right-centre?

I pulled out my guide to show that I, at least, had taken the trouble to check my facts.

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Book Reviews

The Battle of Britain, by Marcel Jullian (Jonathan Cape, London; 295 pp.; illustrated; 35s.).

Some critics have called this an unnecessary book. With so many earlier—some better—books on the Battle of Britain already available, they feel that there is nothing more to add to recorded history. Yet this is untrue, as Marcel Jullian has shown.

One of the four chroniclers of the greatest story ever told ended his book with the comment: "And there are also many other things which Jesus did, the which, if they should be written every one, I suppose that even the world itself could not contain the books that should be written." So it is with the Battle of Britain. The cold, important facts, the vital statistics, might have been recorded and argued about to the satisfaction of those with mechanical minds; but every new anecdote about the battle, every little insight into the character and qualities of those who fought in it, on both sides, adds something to our overall knowledge. So we have good reason to be grateful to Mr. Jullian, whose book is full of such personal colour.

It must be admitted from the start that it is over-coloured, probably because the author spends most of his time writing film scripts. The characters tend to be larger than life . . . but why not? Weren't they? Surely, in the ranks of high command, Churchill, Hitler, Goering, even Hess, were characters that would have taxed the imagination of a playwright; and how many authors would have drawn their dashing young heroes from men with a pair of tin legs or with faces so badly burned as to be almost masks?

Everything about the Battle of Britain was larger than life, and we must decry the efforts of all who would relegate it to just another bloody squabble, as we despise those who try to denigrate the memory of great and respected leaders who they never knew.

Mr. Jullian, after close study of both British and German records, looks at the Battle fairly dispassionately as a Frenchman. He gives the impression of believing that the Battle was lost by the mistakes of the Germans rather than won by the British. Perhaps, in a sense, that is true; but the major mistake was psychological rather than tactical or strategical. Hitler underestimated the cussedness with which a Briton will defend his own personal cabbage patch against any form of enemy or officialdom. This is where Mr. Jullian's narrative comes deliciously alive!

We have a picture of a nation solidly behind the 1,000 pilots who bore the brunt of the German onslaught. "People who had travelled the world came to Home Guard posts with assegais, machetes and clubs . . . Housewives brought packets of pepper to throw in the Germans' eyes . . . Saucepanse were sacrificed to become Spitfires . . ." WAAF Jean Mortimer "was to be seen, after each raid, walking alone across the airfield with a bundle of flags under her arm. Her graceful, self-assured figure would lean forward over the bomb craters as she looked for unexploded bombs. When she saw one she would plant one of her little flags beside the crater, for all the world like a caddy marking out a golf course."

The Battle of Britain was a game to be won—a terrible game in which loved ones died, but in which defeat was unthinkable. To the professional soldiers of Germany it was different. "Horst Zander, a Dornier wireless operator, looked out on both sides and behind. He had the immensely satisfying feeling of being part of a vast invincible fortress . . . The most vicious (of the German aircrew) were enjoying themselves. 'Sitting up there, high in our aircraft, we were happy. It gave us a moment of unforgettable joy to think of the havoc our bombs would wreak on the city below.' "

In these little incidents, through these differences of character, by the unbeatable combination of British pilots in British aeroplanes, and by the inspired leadership of men like Churchill and Dowding (in their very different ways), the Battle was won. This is what Mr. Jullian's book is all about.

J.W.R.T.

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Wings for the Fleet, by Rear Admiral George van Deurs, U.S. Navy (Retired) (United States Naval Institute, Annapolis; 175 pp.; fully illustrated).

The author of this book graduated from the U.S. Naval Academy in 1920 and had a long and distinguished career in naval aviation. He was too young to be counted as one of the pioneer aviators who trained on the "bamboo tails"—the pusher biplanes of the era covered by his book; but he flew everything from the old N-9's to the U.S. Navy's first jet fighters and had ample opportunity of observing the potential of naval aviation at first hand, not least as Commanding Officer of the escort carrier *Chenango* at Morotai, Leyte Gulf and Okinawa.

Wings for the Fleet traces the story of U.S. naval aviation in its earliest years, from 1910 to 1916. In doing so it gives an immense amount of hitherto unpublished detail about incidents like Eugene Ely's first-ever flight from a warship, in a Curtiss biplane, on 14th November, 1910. This flight marked the true beginnings of naval aviation, even if the aircraft did end up between somebody's house and the yacht club, with a splintered propeller as a result of its hitting the water after leaving the ship.

Partial success was not enough. The critics argued that a ship could not fight with its guns boxed in by a take-off platform for an aeroplane and that, anyway, a masthead lookout could see further than Ely had flown.

In the face of such an attitude, Admiral van Deurs' book cannot help giving the impression that successes and progress were achieved despite the Navy rather than with its blessing.

Up to 1909, America had produced the best aeroplanes in the world; but the tail-first Wright biplane was a dead-end design and only Glenn Curtiss emerged immediately with sufficient ability to produce anything better. His pusher biplane landplanes were good, sound machines, but it was as the pioneer of marine flying that he achieved his true greatness. Thus, while the American aircraft industry was incapable of developing and building a single combat aircraft worth sending to France in the 1914-18 War, Curtiss flying-boats and their developments were a mainstay of R.N.A.S. and R.A.F. coastal squadrons. And, of course, after the war, it was a Curtiss flying-boat of the U.S. Navy which made the first transatlantic flight.

Inevitably, therefore, the name of Curtiss dominates this book, which forms a worthy tribute to his genius and to the courage and skill of the pioneers who built such a sound foundation for the vast U.S. Navy air fleets of today. Occasionally, they are credited wrongly with being first with a particular achievement; for example, Francis Evans was not first to discover the spin recovery technique in 1917. Nor, for that matter, was Captain Joseph L. Jayne. Appointed to command the Naval Air Station at Pensacola in 1916, "he quickly saw that the reason planes crashed in spins and stalls was because they flew around the corners too fast. So he ordered pilots to slow down on all turns, and charged those who crashed with the destruction of government property. The surviviors were punished with sentry duty, carrying a rifle and knapsack full of sand."

Since his retirement in 1951, Admiral van Deurs has obtained his Master's degree. He has produced a masterly and beautifully illustrated book as his first contribution to aviation literature since doing so. One can only hope that he will now take the story further, into the roaring twenties. J.W.R.T.

Production under Fire, by Captain Spencer Freeman, C.B.E. (C. J. F. Fallon, Dublin; 213 pp.; 10 illustrations; 27/6 net).

This is the story of "The Emergency Services Organisation" formed by the late Lord Beaverbrook after Dunkirk, to restore production as quickly as possible after bomb damage in all factories engaged in war production.

The author, head of this organisation, recounts the swift action taken restoring 11,000 damaged factories out of the 30,000 employed in war production.

As light relief, to the more serious aspects of war, he takes readers back with him to Ireland in his accounts of his personal activities as a Blood-Stock Breeder, Trainer and Gentleman Rider. A.H.S.

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Soldiers in the Air, by Brigadier Peter Mead (Ian Allan Ltd., Shepperton, Middlesex; 224 pp.; illustrated; 42s.).

The very first military airmen in Britain were soldiers. Soon, however, they began to resent the shortsightedness of the War Office and their late colleagues on the ground, who could see no use for the aeroplane except as an aerial counterpart of the cavalry, for reconnaissance. So, having obtained their independence from the Army and Navy in 1918, the men of the Royal Air Force, led by Trenchard, fought tooth and nail against all suggestions that they should again become subservient to the Army and Navy, as mere support units.

The Navy won back control of carrier-based squadrons by 1937. The Army took a little longer. Air Observation Post flights put in an appearance in 1940, as R.A.F. units under Army operational control, with soldiers as pilots and airmen as technicians. In 1957 the Army obtained full control of a small force of light aircraft, pilots and technicians. This was the rebirth of Army Aviation, the story of which is told in this book by one of the senior officers most responsible for getting the new service off to such a good start.

The reviewer well remembers meeting one of the senior officers of the newly-born force in about 1959 and being told that what it wanted, to replace its outdated Auster lightplanes and Skeeter helicopters, was the Canadian-built Beaver light transport and the French Alouette 2 helicopter. Knowing how seldom British air forces have been given what they want in the past decade, it came as quite a surprise when the Army got its Beavers and a few Alouettes. It might have had more Alouettes had it not been patriotic enough to choose instead the home-built Scout. Clearly, the Army had friends in places unsympathetic to the R.A.F.!

Soldiers in the Air is autobiographical, telling the story of the Army Air Corps against the background of the author's personal experience. Inevitably, therefore, it includes more personal opinion than would an official history, including details of a difference of opinion that developed between the author and another senior officer over the Integration Scheme under which light helicopters were to become normal equipment of army units instead of concentrating all army flying in the Air Corps. Controversy is not necessarily a bad thing, and it is useful to have such matters recorded for future study.

What comes most strongly out of this book is an understanding of the need to build for the army sturdy, reliable, easy-to-maintain aircraft. We read of the troubles that beset the Scout helicopter in its early years, and of the dangers and difficulties of flying for the army. All in all, the reader gains a new respect for the Army Air Corps, even if he has been brought up in the belief that air power ought to be one and indivisible. *Soldiers in the Air* is, in brief, a welcome and worthy successor to *Unarmed into Battle,* the story of the wartime Air Observation Posts.

J.W.R.T.

The United States Air Force, by Brigadier General Monro MacCloskey, U.S.A.F. (Retired) (Pall Mall Press, London; 244 pp.; 17 illustrations; 15 tabulated charts of Commands and 4 maps; 42s. net).

To attempt the history of the U.S.A.F. from 1861 to the present day in 244 pages is no mean task, but nevertheless the author has managed to provide a most interesting outline of the history of an air force that was built-up from 2 balloons in 1861 to the most powerful air force in the world today.

At the beginning of the First World War, the U.S. Army's Aviation Section was a mere 131 officer pilots and student pilots with 200 to 300 aircraft, its rapid expansion from so small a start to one which materially aided the Allies to victory was no small achievement.

General MacCloskey traces its evolution from a single gas-filled raw silk balloon, made by Sergeant Ivy *and his wife,* which was used for observation in the Spanish-American War, to the world's greatest air force and its aerospace possibilities in 1976.

The details of its organisation and operations in two World Wars, which he recounts over the wide field covered by the past 100 years, is full of interest and makes fascinating reading.

A.H.S.

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The Fighter Pilots, by Edward H. Sims. (Cassells, London; 294 pp.; 28 illustrations and 8 diagrams; 45/- net).

Edward Sims, a former fighter pilot with the U.S. Army Air Force, has since the Second World War been a journalist and Editor of various American news agencies and newspapers.

In 1961 he began writing "The Fighter Pilots" in Bavaria and spent four years in Europe on the stupendous task of collecting, from a wide variety of sources, the material for this book, which he completed after ten months further research in England.

The publishers say, in their description of it on the dust cover, "He has constructed a most important — and controversial — record." That it is **"controversial"** is one of the understatements of the year.

The author seems anxious to destroy our cherished, if mistaken, ideas on the "Battle of Britain". He disputes the comparative strengths of the Germans and British engaged in that battle, as given in the officially commissioned history "The Royal Air Force — 1939-45" where it is stated "The German first-line strength greatly exceeded the British" and "the tremendous odds our pilots had constantly to face." He arrives at his conclusion by stating that the Luftwaffe strength of bombers and fighters **participating** in the battle as 2,200 and the British fighters as 749, but he proceeds to add to this 600 bombers of Bomber Command (which did not participate in the battle). With what follows he gives the impression that he is at pains to write down the victory of "The Few" and find excuses for the defeat of the German Luftwaffe in that battle (which will not be a popular suggestion among British readers).

Some of the author's views on the comparative capabilities of British fighter pilots with those of other nations are open to dispute. Apart from these criticisms this book offers some very interesting reading.

The detailed accounts of missions carried out by well known fighter pilots of all the nations participating in World War II, which are supported by excellent charts, are of particular interest, as are his descriptions of the operations of fighter pilots on the many operational fronts. As Group Captain Douglas Bader says in the Foreword:—

" War books are always of interest and this is a special one."

Controversy is the spice of life and whether one agrees or disagrees with some of the author's conclusions it is well worth reading. A.H.S.

Canoeing Skills and Canoeing Expedition Techniques for Teachers and Leaders, by Squadron Leader P. F. Williams. (Pelham Books Ltd., London; 155 pp.; 15 illustrations and over 100 sketch diagrams; 25/- net).

Squadron Leader Williams was trained as a physical education master at Fredensborg College of Physical Education, Denmark and Trinity College, Carmarthen, Wales. He played Rugby for Swansea, London Welsh and R.A.F. and held at one time both Welsh Youth and Junior records for 100 yards. This is a wonderful record for a physical fitness officer. As such he has served at Cranwell, St. Athan and is at present Senior Fitness Officer at Cosford. His qualification as a British Canoe Union Coach in Britain and on the Continent indicates his capability for writing an authoritative book on this subject.

This book covers the simplest instructions in canoeing and organised expeditions to the highly technical details of interest to experts; from the simple guidance of how to get in and out of a canoe to the advanced skills of a canoe salom and Eskimo roll to recover if capsized.

It tells the reader where to canoe (and legal restrictions); organisation of expeditions; camping sites; cooking fires; equipment; clothing and bivouacs.

In the appendices will be found rules for safety; the grading of rivers; inland and sea tests and a glossary of canoeist terms with their meanings.

This is an excellent book for would be canoeists and the more experienced ones; it is of particular interest to those concerned with expedition training and the Duke of Edinburgh Award Scheme. A.H.S.

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Aircraft — Aircraft, by John W. R. Taylor. (Paul Hamlyn, London; 140 pp.; 250 illustrations of which 24 are coloured; 15/- net).

The name of John W. R. Taylor on any book is a guarantee of accuracy of facts and quality of production. John Taylor is the Editor of "Jane's All The World's Aircraft," B.B.C. broadcaster and the author of more than 100 books on aircraft.

Aircraft — Aircraft measures 11" x 8½"; its artisically designed cover made up of 7 coloured pictures of aircraft, 250 illustrations (of which 24 are coloured) and the wealth of information in the text, must make it the best value for money on the market at 15/-.

It fills in many gaps in what is generally known of the history of aviation, both in text and hitherto unpublished pictures, which covers from bird-men in chicken-feathered wings to space-men in capsules.

Daedalus and Icarus we know, but who were "Bladud" (863 B.C. a contemporary of Elijah), "Oliver of Malmesbury" (1020 A.D.), "The Saracen of Constantinople," "Hezarfen Celebi" and many others who made solo flights, many with fatal results. It covers many adventures in the progress of aviation from death-jumps from castles, through lighter-than-air period to recent space-flights. It is a fascinating book for all youngsters interested in aviation and of absorbing interest to the over 70's, throughout whose lives has been the amazing progress of flying, from the Wright brothers to preparations for a moon landing.

This book provides an interesting comparison between those who fly for the joy of flying and those who merely accept it as an improvement in getting swiftly from one place in the world to another. In many it will arouse nostalgic regrets for the days of open cockpits when every flight was an exciting adventure. A.H.S.

The British Bomber since 1914, by Peter Lewis (Putnam & Company, Ltd., London; 418 pp.; fully illustrated; 63s.).

The first bomb-dropping experiments from an aeroplane were made in America in 1911; the first attack on an enemy in wartime with bombs dropped from an aeroplane was made by Lt. Cavotti of Italy on 1st November in the same year. The Italians can also claim to have been among the first exponents of strategic bombing in the 1914-18 War, using their magnificent Caproni twin-engined bombers.

Having said that, most of the subsequent development of the bomber aircraft and bombing techniques was centred in the United Kingdom. Experience in the strategy of non-stop bombardment of enemy targets by the Independent Force of the R.A.F. in 1918 convinced Trenchard that this was the key to this country's future survival. As a result, strategic bombing became the cornerstone of our defence policy and paid rich dividends in World War II. Germany and the U.S. Navy exploited the dive-bomber, but the technique was first practised by the R.F.C. in France with specially-modified Sopwith Camels one war earlier. As for the torpedo attacks mounted so effectively by the Japanese in the Pacific, these were not only pioneered by the R.N.A.S. and R.A.F.—the technique was actually taught to the Japanese Navy by a British Mission.

How many different types of British bomber do you, the reader, imagine were designed and built, from the Bristol T.B.8 of 1913 to the BAC TSR.2 of 1964? If you start counting them from memory, or even jotting down a list, including variants, you will probably still end up far short of the staggering total of 560 different types covered in Mr. Lewis's new companion volume to his earlier work on *The British Fighter*.

He does, admittedly, cast his net a little wide at times. By including "with the exceptions of the fighter-bomber and the flying-boat, all types capable of carrying bombs or torpedoes, including military and naval landplanes and floatplanes, general purpose aircraft, dive-bombers and coastal defence patrol machines", he lets in a number of somewhat dubious "bombers" such as the Bristol F.2B army co-operation machines supplied to Belgium after the 1914-18 War and the Lysander. These are probably less eligible for inclusion than torpedo aircraft

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such as the Beaufighter TF.X and Firebrand Mks. III to V, which are excluded as "fighters". However, the division of sheep from goats in any sphere is arbitrary and no two aviation writers would ever produce the same list of types for inclusion in any book of this kind.

What matters is that Mr. Lewis has unearthed a great number of new and fascinating facts and figures on British bombers together with several real gems among the 306 photographs. There are a few mistakes, the worst perhaps being a perpetuation of the fallacy that the first person to launch a torpedo from the air was Sir Arthur Longmore. In fact, it was Gordon Bell, flying a Short seaplane, at Calshot, on 28th July, 1914.

Nobody who has at heart the best interests of Britain, the Royal Air Force or world peace will disagree with the last few paragraphs of the book, in which Mr. Lewis describes the TSR.2 and assesses its worth. In destroying the most advanced aircraft of its kind every built, our Government not only disregarded the proven soundness of the R.A.F.'s traditional policy of deterrence and attack; it took away the spirit of our aircraft industry, left the R.A.F. emaciated and, by ordering an American aeroplane that is at best a pale shadow of the TSR.2, helped to worsen our economic crisis. Well might Mr. Lewis conclude that his book represents "half a century of triumph terminating in tragedy." J.W.R.T.

Manned Spacecraft, by Kenneth Gatland (Blandford Press, London; 256 pp.; fully illustrated; 18s.).

During World War 2, the reviewer and the author of this book worked together in the drawing office of what was then Hawker Aircraft Ltd. The drawing boards all around us were covered with three-views of fighter aeroplanes and pieces of fighter aeroplanes; but even then Mr. Gatland was thinking far beyond the speeds and heights that these aircraft would attain. At home, he threatened to blow the roof off his house by experimenting with rocket fuels. He formed a small society of people interested in the possibility of future space travel. After the war, with two colleagues of the British Interplanetary Society, he presented a paper on "Minimum Satellite Vehicles" at the second Congress of the International Astronautical Federation, six years before the first Sputnik went into orbit. The paper is now a classic and Mr. Gatland, Vice-President of the British Interplanetary Society, is not only held in universal respect but has had the personal satisfaction of seeing many of his dreams come true.

With such a background, there is little need to state that this book on *Manned Spacecraft* is comprehensive, accurate and probably the best primer on its subject yet published. It is a companion to Blandford's series of books which make up *The Pocket Encyclopaedia of World Aircraft in Colour* and has been illustrated by the same artists. Eighty pages in full colour represent remarkable value for money in such a modestly-priced book; but it is the quality as much as the quantity which impresses.

However many times one has seen black and white photographs of spacecraft such as Yuri Gagarin's Vostok and the lunar module in which America's Apollo astronauts will land on the Moon, they take on a new meaning when shown sectioned, in full colour. One appreciates anew the genius of those who design such craft, packing so much in so small a space—not only to transport men but to provide them with everything needed to sustain life in a frighteningly-hostile environment.

This is a book to be treasured by young enthusiast and technical expert alike. It covers the complete history of practical spaceflight, from Sputnik 1 to Apollo, the manned orbiting laboratory that America plans to put into orbit in 1969 and the piloted lifting-body research aircraft now under test in the U.S.A. It is, of course, a record of American and Soviet achievement, for the generations of British adventurers on Earth have no counterpart in space. At least, as *Manned Spacecraft* shows, we can still produce in Britain the best historical records of the great new science, in the kind of language that everyone can understand. J.W.R.T.

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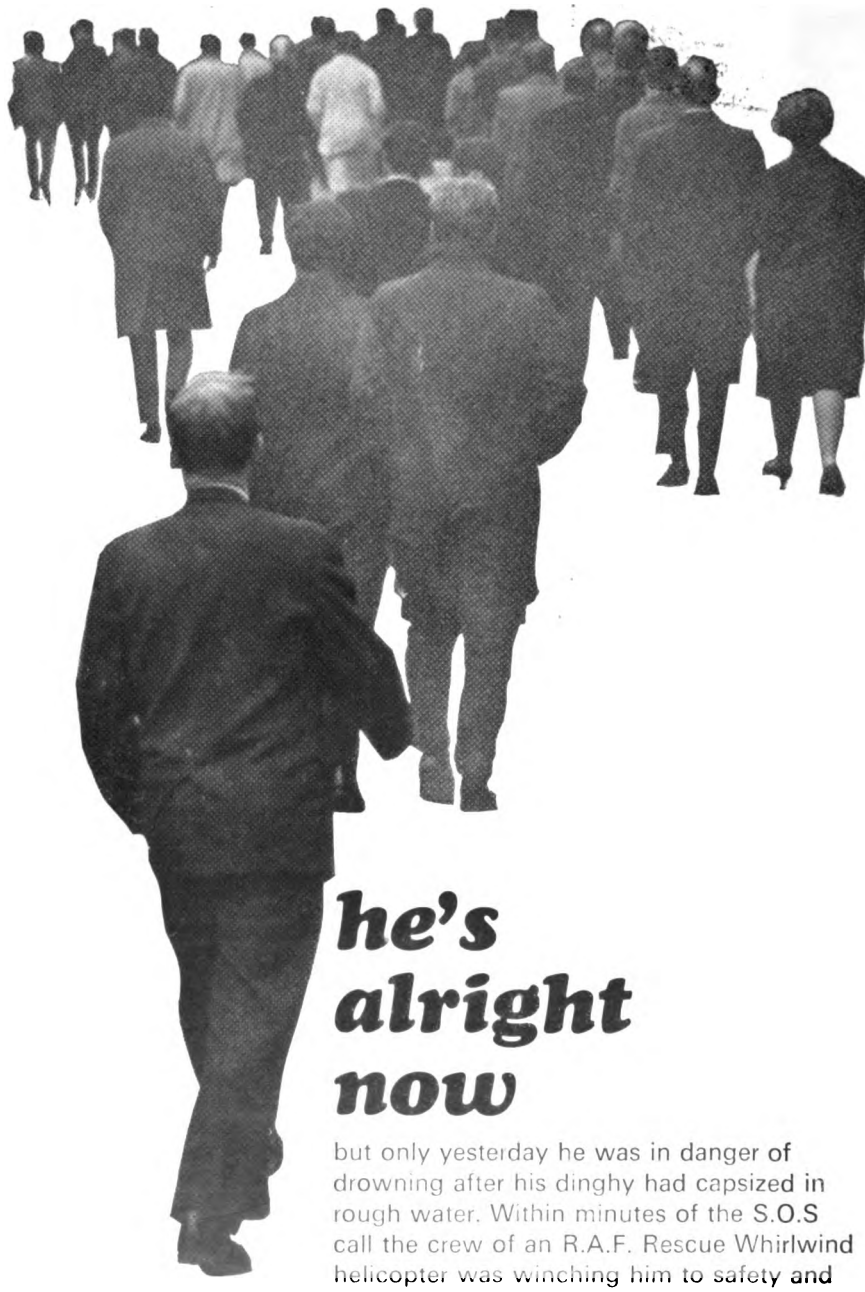

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